David J. Tweardy, MD

Interview 102

Interview Navigation Materials

Date submitted: 1 August 2019

Interview Information:

Three sessions: 22 January 2019 (1:40); 20 March 2019 (1:45); 17 April 2019 (1:38)

Total approximate duration: 5 hours

Interviewer: Tacey A. Rosolowski, Ph.D.

To request the interview subject's CV and other supporting materials, please contact:

Tacey A. Rosolowski, PhD, trosolowski@mdanderson.org Javier Garza, MSIS, jjgarza@mdanderson.org

Interview Subject Snapshot:

Name: David J. Tweardy, MD

Interviewed: 2019

Primary appt: Infectious Diseases

Research: molecular biology of cytokines

Admin: Head of Division of Internal Medicine (2014 - present)

Other:

Interview link:

About the Interview Subject

David J. Tweardy, MD (b. 12 February 1952, Charleroi, Pennsylvania) came to MD Anderson in 2014 to serve as head of the Division of Internal Medicine and join the faculty as a full professor in the Department of Infectious Diseases, Infection Control and Employee Health. At the time of the interview he also served as Department Chair ad interim for Department of Cardiology, Division of Internal Medicine. He has joint appointment in the Department of Molecular and Cellular Oncology in the Division of Basic Science Research, and in the Department of Department of Medicine, Section of Infectious Diseases, at the Baylor College of Medicine in Houston. His research includes: cytokine signaling and oncogenesis (structural and biochemical features of signaling proteins and oncoproteins that effect susceptibility to small-molecule modulation); interactions of STAT3 and other oncoproteins with the major eukaryotic protein-folding machine; use of proteostasis modulators to improve the function of mutated

transcription factors that cause immunodeficiencies; contribution of STAT3 to infection- and inflammation-induced carcinogenesis; dtructure-based and high-throughput approaches to developing small-molecule inhibitors of STAT3; contribution of STAT3 to asthma and other allergic disorders.

Major Topics Covered:

Personal background and education; spirituality; evolution of perspective on science and medicine

Research: cytokines and shift to focus on oncology

Administrative experience prior to MD Anderson: University of Pittsburg, Baylor College of Medicine

The Division of Internal Medicine: leadership of, priorities, development of strategic plan for, developing emergency medicine and hospitalist service

Leadership and institutional change during transition from Ronald DePinho; climate in institution; managing Division during transition; view of Marshall Hicks' leadership; process of re-directing institution during transition; shared governance, operational priorities, building communication and transparency at leadership levels.

About transcription, the transcript, and the views expressed

This interview had been transcribed according to oral history best practices to preserve the conversational quality of spoken language (rather than editing it to written standards).

The interview subject has been given the opportunity to review the transcript and make changes: any substantial departures from the audio file are indicated with brackets [].

The Archives may have redacted portions of the transcript and audio file in compliance with HIPAA and/or interview subject requests.

The views expressed in this interview are solely the perspective of the interview subject. They do not represent the official views of any other individual or of The University of Texas MD Anderson Cancer Center.

David J. Tweardy, MD

Interview 102

Table of Contents

Interview Session One: 22 January 2019

Interview Identifier
Segment 00A

A Large Eastern European Family, a Scholarship, and A Scientist's View of Spirituality Chapter 01 / A: Personal Background;

A Focused Student Intent on Science Education Chapter 02 / A: Educational Path;

An Inspirational Friend, Sports, and Spirituality Chapter 03 / A: Personal Background;

"Thinking Like an Electron" in College: From Engineering, to Chemistry, to Molecular Biology Chapter 04 / A: Educational Path;

Medical School Leads to a Research Focus on Cytokines Chapter 05 / A: The Researcher;

Interview Session Two: 20 March 2019

Interview Identifier Chapter 00B

Cytokines and Cancer-Related Research at the University of Pittsburg (late Eighties)

Chapter 06 / A: The Researcher;

Research and Administration at Baylor College of Medicine

Chapter 07 / A: The Researcher;

A New Role as Division Head at MD Anderson Chapter 08 / B: Building the Institution;

Stepping in to an Institution Undergoing Change Chapter 09 / B: Building the Institution;

Interview Session Three: 17 April 2019

Interview Identifier
Chapter 00C

MD Anderson in Transition: Rebuilding and Integrating Relationships Before and After Dr.

DePinho's Resignation

Chapter 10 / B: Building the Institution;

The McChrystal Group, the Rolling Operational Priorities (2015, and Observations on Strategic Planning
Chapter 11 / B: Building the Institution;

From Marshall Hicks, MD as Interim President to Peter Pisters, MD Chapter 12 / A: Overview;

Emergency Medicine and the Hospitalist Service Chapter 13 / B: Building the Institution;

Final Comments and What Might Be Next Chapter 14 / A: Overview;

David J. Tweardy, MD

Interview 102

Chapter Summaries

Interview Session One: 22 January 2019

Chapter 00A Interview Identifier

Chapter 01

A Large Eastern European Family, a Scholarship, and A Scientist's View of Spirituality

A: Personal Background;

Codes

A: Personal Background;

A: Character, Values, Beliefs, Talents;

A: Influences from People and Life Experiences;

A: Faith:

In this chapter, Dr. Tweardy talks about his family and early education and sketches the roots of his own spiritual beliefs.

He begins by sketching the immigrant roots of his family in the area formerly known as Slovenia in Eastern Europe. He talks about the origin of his name and the pride of place he grew up with in Pennsylvania in his large family. He also discusses being raised as a Byzantine Catholic, and his own relationship with faith, which transformed over his life into a spiritual sense connected to science.

Next, Dr. Tweardy explains how he was able to get a scholarship from U.S. Steel, where his father was employed, to transfer to South Kent High School. This gave him access to a very good secondary education.

He explains that he and his six siblings formed three subgroups, with he and his brother Jim and sister Susan being the spiritual ones in the family. He explains the influence of his mother, who had great emotional intelligence and who taught him that instances of deprivation could be seen in a spiritual light.

Chapter 02

A Focused Student Intent on Science Education

A: Educational Path;

Codes

A: Personal Background;

A: Character, Values, Beliefs, Talents;

In this chapter, Dr. Tweardy talks describes himself as a student, noting that he was always "on the spectrum" of autism and Asperger's Syndrome, with an extraordinary ability to concentrate and a strong visual imagination. He describes his "excitement about everything" in elementary school and how he explored scientific topics, deciding he would be an astronomer. He explains how he zeroed in on engineering, so that when he was admitted to Princeton University [AB conferred, 1974, Cum Laude, Chemistry] he majored in aerospace engineering.

Dr. Tweardy compares the cultures of South Kent High School and Princeton.

Chapter 03

An Inspirational Friend, Sports, and Spirituality

A: Personal Background;

Codes

A: Personal Background;

A: Character, Values, Beliefs, Talents;

A: Influences from People and Life Experiences;

A: Faith:

In this chapter, Dr. Tweardy makes connections between his practice in sports and his spiritual sensibility. He begins by talking about an influential friend he at Princeton, Louis Rinaldini, who convinced him to join the crew team. Dr. Tweardy then talks about lot about the experience of rowing crew, where in peak moments, the rower will reach a state of ecstasy. He describes the spiritual dimensions of this experience, shares an analogous experience in basketball, and makes the connection with his sense of spirituality and science.

Chapter 04

"Thinking Like an Electron" in College: From Engineering, to Chemistry, to Molecular Biology

A: Educational Path;

Codes

A: Character, Values, Beliefs, Talents;

A: Personal Background;

A: Professional Path; C: Evolution of Career;

A: Inspirations to Practice Science/Medicine;

A: Influences from People and Life Experiences;

D: Understanding Cancer, the History of Science, Cancer Research;

In this chapter, Dr. Tweardy explains how he shifted from a major in aerospace engineering to chemistry, eventually making the decision to apply to medical school. He talks about academic challenges he faced in his first year at Princeton University, how he developed the mindset of an academician, and how he discovered, while taking organic chemistry, that he could "think like an electron." As this was in the early days of biochemistry, he made the move into cell biology. Dr. Tweardy then explains how he began to think about medical school for his further education.

Chapter 05

Medical School Leads to a Research Focus on Cytokines

A: The Researcher;

Codes

A: The Researcher;

A: Character, Values, Beliefs, Talents;

A: Personal Background;

A: Professional Path; C: Evolution of Career;

A: Inspirations to Practice Science/Medicine;

A: Influences from People and Life Experiences;

C: Patients, Treatment, Survivors;

C: Mentoring; D: On Mentoring;

A: Definitions, Explanations, Translations;

A: Overview;

C: Discovery and Success;

Dr. Tweardy begins this chapter by noting that he was always a physician-scientist, and he explains why he did several post-doctoral fellowships after medical school [MD, 1978, Harvard Medical School, Medicine] instead of doing a PhD program.¹

He explains that he approached medical school through the sciences and particularly enjoyed the coursework in the first two years, when he refined his interest in chemical structures and macromolecules: he began to focus exclusively on proteins and their interactions with small molecules. He was doing this work in the early days of cloning, which led to his work on cytokines.

Next, Dr. Tweardy reflects on a "wrenching experience" at Case Western Reserve [1980 Case Western Reserve, Intern/Resident], when a patient with AML died of sepsis. Dr. Tweardy then became interested in how to treat infection and have an impact on the underlying problem of

¹; 1983, Case Western Reserve, Research Associate, Infectious Diseases; 1986 three yrs at Wistar Institute, Research Associate, Molecular Hematology.

chemotherapy-induced neutropenia by working with molecular mechanisms that "jumpstart the marrow."

Dr. Tweardy then speaks about his discovery of the complexity of immunology [1982] during his fellowship in infectious diseases at the same institution. He explains mechanisms for influencing macrophage activation to address the immune system. Through his work with Jerry Ellner, he was able to conduct a study where he isolated monocytes from patients and show that they didn't have as much HLAD on their surfaces. After incubating them, they grew and they believed they were producing macrophage activating factor. They wrote a letter to Genentech requesting [WHAT?], which enabled him to show a positive result on all the immunological XXX that would affect the white cells.

Interview Session 02: 20 March 2019

Chapter 00B Interview Identifier

Chapter 06

Cytokines and Cancer-Related Research at the University of Pittsburg (late Eighties)

A: The Researcher;

Codes

A: The Researcher;

A: Overview;

A: Definitions, Explanations, Translations;

D: Understanding Cancer, the History of Science, Cancer Research;

A: Personal Background;

C: Discovery and Success;

A: Inspirations to Practice Science/Medicine;

A: Influences from People and Life Experiences;

D: Technology and R&D;

In this chapter, Dr. Tweardy traces the evolution of his work from the early stage of purifying and cloning cytokines (see Chapter 05) through the discovery of the relationship between STATG and STAT3. He begins by noting his interest in participating in the groundbreaking work on cytokines because of the further discoveries it promised. He talks about his move from the Wistar Institute to the University of Pittsburg, occasioned because of his wife's career (Ruth Falik, MD; married 21 January 1982), then discusses his work with a library of bacterial RNA to discover mechanisms for producing cytokines, shifting to studies of neutrophils.

Dr. Tweardy then explains that his work at the new cancer institute at the University of Pittsburg enabled him to shift his focus to cancer and leukemia. He explains leukemia creates abnormalities in GCFS [granulocyte colony-stimulating factor?] its molecular signaling. He

explains how he collaborated with an ENT surgeon to discover mechanisms of the role STAT3 serves in squamous cell proliferation and later work on how to block its function. He discusses how this work contributed to differentiating the roles of STAT3 and STATG.

Chapter 07

Research and Administration at Baylor College of Medicine A: The Researcher;

Codes

C: Leadership; D: On Leadership;

C: Mentoring; D: On Mentoring;

A: The Researcher;

A: Overview;

A: Definitions, Explanations, Translations;

D: Understanding Cancer, the History of Science, Cancer Research;

A: Personal Background;

In this chapter, Dr. Tweardy sketches the work he accomplished once he joined the Department of Medicine at Baylor College of Medicine (in 2006) and assumed roles as deputy chair, chair ad interim, and chair. He notes that at the University of Pittsburg he learned to love administration and sketches the reasons he found Baylor attractive: administrative opportunities, clinical practice, and research technology.

Next, Dr. Tweardy talks about developments in his research as he began to work on small molecule probes. He explains that he began to act on his desire to mentor the next generation of physician-scientists [via a K award]. He illustrates some leadership lessons with anecdotes and comments on the stressed financial climate at Baylor. He also describes his leadership style and proclivity for working with teams. He gives overview of what he gained working in administrative roles at Baylor College of Medicine and comparing the culture at Baylor to MD Anderson's

Chapter 08

A New Role as Division Head at MD Anderson

B: Building the Institution;

Codes

A: Joining MD Anderson/Coming to Texas;

B: MD Anderson Culture;

C: Leadership; D: On Leadership;

C: Portraits:

C: The Institution and Finances;

He gives an overview of how he stepped into his role as head of the Division of Internal Medicine (2014). He begins by explaining that Dr. John Mendelsohn [oral history interview]

began to organize departments around onco-medicine, and this included recruiting a critical mass of specialists to manage the Division of Internal Medicine. He sketches changes in division leadership.

Dr. Tweardy then explains how became aware of the job, the appeal of the position, and the vision he had for division. He then talks about differences in the culture at Baylor College of Medicine. He sketches leadership lessons he learned in his interim chair roles that would serve him at MD Anderson.

Next, Dr. Tweardy talks about his good working relationship with Ethan Dmitrovsky, MD [oral history interview], the Provost, and the overlap in their ideas for developing the division: building service excellence, growing research, and recalibrating expectations.

Dr. Tweardy then talks about the "excessive siloism" at MD Anderson, the hierarchies among divisions, and the challenges of establishing the value of the Division of Internal Medicine. He explains the steps he took to address the visibility and perception of the Division's value, discussing in particular the steps taken to improve and showcase financial accountability.

Chapter 09 Stepping in to an Institution Undergoing Change B: Building the Institution;

Codes

- B: Building/Transforming the Institution;
- B: Growth and/or Change;
- B: MD Anderson Culture;
- C: Portraits:
- B: Institutional Politics;
- B: Controversy;
- B: Research;
- B: Critical Perspectives on MD Anderson;
- C: Understanding the Institution;
- D: On Research and Researchers;

In this chapter, Dr. Tweardy begins to share his impressions of the period of turbulence MD Anderson was experiencing in 2012, 2013, after Ronald DePinho [oral history interview] became president. He begins by recalling what he heard about the institution while he was still at the Baylor College of Medicine and explains why he didn't allow the stories to influence his view of MD Anderson. He talks about his respect for Dr. DePinho then explains how his view of the situation at MD Anderson shifted once he became division head and he saw problems with morale and other issues.

Next, Dr. Tweardy comments on the "three factors" that turned the situation around: Dr. Steven Hahn's appointment as Chief Operating Officer; the impact of the Faculty Senate and the work of Julie Izzo, MD and Ann Killary, PhD; Marshall Hick's [oral history interview] role as interim

president and the shared governance model he helped institute. He also talks about the impact of the McChrystal Group and the creation of the ROPR system for tracking institutional performance and change.

Interview Session Three: 18 April 2019

Chapter 00C

Interview Identifier

Chapter 10

MD Anderson in Transition: Rebuilding and Integrating Relationships Before and After Dr. DePinho's Resignation

B: Building the Institution;

Codes

B: Building/Transforming the Institution;

B: Growth and/or Change;

B: MD Anderson Culture;

C: Portraits;

B: Institutional Politics;

B: Controversy;

B: Research:

B: Critical Perspectives on MD Anderson;

C: Understanding the Institution;



In this chapter, Dr. Tweardy discusses the creation of the Committee of Division Heads and the Committee of (Department) Chairs, two bodies needed to build communication channels and strengthen faculty trust and engagement. He points out that the Committee of Division Heads recognized Dr. Marshall Hicks as the best person to serve as interim president after Dr. DePinho's resignation. Dr. Tweardy talks about the impact of these committees during the reduction in force in 2015 and the implementation of Epic.

Next Dr. Tweardy talks about the role of Julie Izzo and Ann Killary in strengthening the impact of the Faculty Senate in restabilizing the institution: he notes that this added another layer of integration to the institution.

Dr. Tweardy then talks about the divisional issues he brought to the Committee of Division Heads. He explains how he saw his role. He also notes that he was struck by the "level of alarm" that the Faculty Senate expressed regarding the new governance structure that was evolving: he makes comparisons with the faculty senates at the colleges of medicine at Baylor and Pittsburg. He reflects on the communication channels that evolved and observes that new people were stepping into the role of communication broker.

Chapter 11

The McChrystal Group, the Rolling Operational Priorities (2015, and Observations on Strategic Planning

B: Building the Institution;

Codes

- B: Building/Transforming the Institution;
- B: Growth and/or Change;
- B: MD Anderson Culture;
- B: Institutional Politics;
- B: Controversy;
- B: Critical Perspectives on MD Anderson;
- C: Understanding the Institution;

In this chapter, Dr. Tweardy sketches the institution's work with the McChrystal Group to develop the "rolling operational priorities" to organize the stabilization efforts. He sketches the process of working with the McChrystal Group and the two major outcomes: a decision-making process leading to Shared Governance Committee approval and the organization of work groups that addressed different institutional issues (the ROPRs). Dr. Tweardy notes that he was in charge of the ROPR3, which focused on education. He describes how each work group's activities were organized to identify priorities to address.

Next, Dr. Tweardy talks about the value of this system and notes that when the relationship with McChrystal ended, the institution was very functional in decision making. He explains that the ROPR system was built on the "pyramid" structure of strategic planning and, in turn, laid the foundation on which the current strategic planning process (under Peter Pisters, MD) is built.

Chapter 12

From Marshall Hicks, MD as Interim President to Peter Pisters, MD A: Overview;

Codes

- C: Leadership; D: On Leadership;
- B: Working Environment;
- B: Building/Transforming the Institution;
- B: Growth and/or Change;
- B: Obstacles, Challenges;
- B: Institutional Politics;
- B: Controversy;
- B: MD Anderson Culture;
- C: Portraits;
- B: The Business of MD Anderson; C: The Institution and Finances;

In this chapter, Dr. Tweardy talks about the change in leadership perspective once Dr. DePinho resigned and interim president Marshall Hicks, MD took leadership, preparing for permanent president, Dr. Peter Pisters, MD. Dr. Tweardy explains that Dr. Hicks brought a philosophy of servant leadership and process focus, a perspective Dr. Pisters continued. Dr. Tweardy sketches his views of Dr. Pister's first year, noting he focuses on professionalism, mentoring for leadership, and safety. He explains that Dr. Pisters also bring a focus on the complexity of the changing healthcare environment and MD Anderson's place within this, including its competitive status in the region.

[pause in recording]

Dr. Tweardy explains that the research community has been waiting to see evidence of Dr. Pister's commitment to the research agenda, and his appointment of Guilio Draetta as Chief Scientific Officer has begun to address this challenge.

Next, Dr. Tweardy comments on Dr. Pister's slow and deliberate decision making style. He then comments on the tradition of long-tenured presidents at the institution.

Chapter 13

Emergency Medicine and the Hospitalist Service B: Building the Institution;

Codes

- C: Leadership; D: On Leadership;
- B: Working Environment;
- B: Building/Transforming the Institution;
- B: Growth and/or Change;
- B: Obstacles, Challenges;
- B: Institutional Politics; A: Definitions, Explanations, Translations;
- A: Overview;
- B: Survivors, Survivorship; C: Patients, Treatment, Survivors;
- C: Cancer and Disease; B: MD Anderson Culture;
- D: The History of Health Care, Patient Care;
- D: Understanding Cancer, the History of Science, Cancer Research;

In this chapter, Dr. Tweardy talks about a major initiative he undertook on becoming division head: building the institution's emergency medicine readiness and hospitalist service. He begins by explaining that the medical management of acutely ill patients is a challenge and that when he arrived in 2014, the institution was not addressing this as effectively as it should be, even though the emergency center was established in 2012. Dr. Tweardy explains that he wanted to institution to deliver not only the best cancer care, but the best onco-medical care then talks about developing hospitalist and emergency services.

Next, Dr. Tweardy comments on the resistance to emergency services and instances of the institution's conservative thinking about the treatment of acute patients. He observes that it can be helpful to have an outsider bring in a new perspective and a new way of organizing functions.

Chapter 14 Final Comments and What Might Be Next A: Overview;

Codes

C: Leadership; D: On Leadership;

A: Professional Path;

A: Personal Background;

B: Building/Transforming the Institution;

B: Growth and/or Change;

A: Overview;

In this chapter, Dr. Tweardy talks about career paths for leaders, how his own has evolved, and what might be next though he has no immediate plans to leave the institution. He next talks about his plans for the Division: to stay aligned with the institution's strategic plan and to address some issues in the internal leadership pipeline. He notes how his division has opportunities to grow through the MD Anderson Network.

David J. Tweardy, MD

Interview 102

Interview Session One: January 10, 2018

About transcription, the transcript, and the views expressed

This interview had been transcribed according to oral history best practices to preserve the conversational quality of spoken language (rather than editing it to written standards).

The interview subject has been given the opportunity to review the transcript and make changes: any substantial departures from the audio file are indicated with brackets [].

The Archives may have redacted portions of the transcript and audio file in compliance with HIPAA and/or interview subject requests.

The views expressed in this interview are solely the perspective of the interview subject.

They do not represent the official views of any other individual or of

The University of Texas MD Anderson Cancer Center.



Interview Date: January 23, 2019

Chapter 00A Interview Identifier

T. A. Rosolowski, PhD

[00:00:02]

Okay, we are recording, our counter is moving, and today is January 23rd, 2019. The time is almost 25 minutes after 2:00, and I'm in the office of Dr. David J. Tweardy—am I pronouncing your name correct? Okay, cool—for our first interview session, and I want to thank you very much for making the time in your busy schedule.

[00:00:25]

David Tweardy, MD

[00:00:25]

Oh, my pleasure, really. I'm looking forward to this. [00:00:27]

T. A. Rosolowski, PhD

[00:00:27]

Because you came to MD Anderson in 2014, correct? [00:00:31]

David Tweardy, MD

[00:00:31] That's correct. [00:00:31]

T. A. Rosolowski, PhD

[00:00:32]

—to head the Division of Internal Medicine. [00:00:34]

David Tweardy, MD

[00:00:34] Correct. [00:00:34]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:00:35]

All right. And I also want to mention you're a full professor in the Department of Infectious Diseases, Infection Control, and Employee Health. Is that the full name of it? [00:00:45]

David Tweardy, MD

[00:00:45] Yes, it's a big— [00:00:46]

T. A. Rosolowski, PhD

[00:00:46] It is! [00:00:46]

David Tweardy, MD

[00:00:46] Longest name in the institution. [00:00:47]

T. A. Rosolowski, PhD

[00:00:47] Is it really? [00:00:48]

David Tweardy, MD

[00:00:48] Yes. [00:00:48]

T. A. Rosolowski, PhD

[00:00:48]

Oh my god. And that's in the Division of Internal Medicine. And I also found you were serving as Department Chair at interim for the Department of Cardiology? Is that correct? [00:00:57]

David Tweardy, MD

[00:00:57] Yes.

[00:00:57]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:00:57] Okay, cool. [00:00:58]

David Tweardy, MD

[00:00:57]

It's my second stint as an interim Chair here.

[00:01:00]

T. A. Rosolowski, PhD

[00:01:00]

Yeah, I noticed from your record. I mean, that'll be interesting to talk about. There's a whole thing about serving as interim, isn't there?

[00:01:05]

David Tweardy, MD

[00:01:05]

Yeah.

[00:01:05]

T. A. Rosolowski, PhD

[00:01:05]

Yeah. Yeah, yeah, it's a very neat thing. And there are a number of other things, but I'm sure we will get to that. Also, just to flesh out the identifier, this interview's being conducted for the Making Cancer History Voices Oral History Project, run by the Historical Resources Center at the Research Medical Library at MD Anderson Cancer Center in Houston, Texas. And, well, I think we're kind of ready to roll, if you are.

[00:01:31]

David Tweardy, MD

[00:01:31]

I'm ready.

[00:01:31]



Interview Date: January 23, 2019

Chapter 01

A Large Eastern European Family, a Scholarship, and A Scientist's View of Spirituality

A: Personal Background;

Codes

A: Personal Background;

A: Character, Values, Beliefs, Talents;

A: Influences from People and Life Experiences;

A: Faith;

T. A. Rosolowski, PhD

[00:01:31]

All right, excellent. So let me just start in the traditional oral history place, which is: tell me where you were born, and when, and tell me a little about your family. [00:01:42]

David Tweardy, MD

[00:01:42]

Ah. Yes, I was born in February 12th, 1952 in Charleroi, Pennsylvania. It turns out—I really list Monessen, because it's right across the river, and Charleroi had the hospital. [00:02:00]

T. A. Rosolowski, PhD

[00:02:00]

What is the town across the river? L—? [00:02:03]

David Tweardy, MD

[00:02:03]

Monessen. So it's really one of those situations, where do you list as your place of birth; do you list where you actually were born, or where your family lived? And so, because this is an oral history, I'm trying to be very exact. So I grew up—and so I was born in Charleroi, which, as somebody of French descent, it was named after the French. It was—both small towns were along the Monongahela River, in southwest Pennsylvania. The Monongahela River flows north. It's sort of where the waters of the western edge of the Appalachians, the Alleghenies, collects and flows in to meet the Allegheny River to form the Ohio at Three Rivers, which is Pittsburgh. [00:02:48]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:02:48]

That sounds like something you heard a lot as a child, a narrative of the rivers. (laughs) [00:02:51]

David Tweardy, MD

[00:02:50]

Yes. Oh, yes! For instance, what is the—what river flows north besides the Nile? And, of course, all the third-graders would say, "The Monongahela!" [00:02:59]

T. A. Rosolowski, PhD

[00:02:59]

There we go. I could see that on tests and quizzes and—yeah, yeah. [00:03:02]

David Tweardy, MD

[00:03:01]

Oh, yeah. In fact, we—just like Texas—I mean, I think Pennsylvania has a long history with pride of place. We did history of the State of Pennsylvania third grade, and that's where you learn those kind of things, but—[00:03:13]

T. A. Rosolowski, PhD

[00:03:13]

Yeah. I am familiar with that, being from New York State, as well. [00:03:16]

David Tweardy, MD

[00:03:16]

Oh, yeah. New York State thinks very highly of itself. The Commonwealths hold themselves a little bit above the rest of the states. Of course, the Republics hold themselves even higher, and that's really Texas and California. For nine days, I think, California was its own republic. So I grew up there, I—large family. My grandparents, actually from both sides, my mother's parents as well as my father's parents, came from Eastern Europe, a small town in what is ethnically called Ruthenia, but is actually an area now in the Ukraine. At the time it was part of Slovakia, or Czechoslovakia, but those borders, as you know, have been somewhat fluid. [00:04:03]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:04:03]

Now, your name, did that get altered at Ellis Island?

[00:04:05]

David Tweardy, MD

[00:04:06]

Actually, it's a very good question. So the answer is no, but somewhere between Ellis—well, here's what I'll say: I ended up—in 2000, I guess—yeah, two years ago, two and a half years ago, we went to visit New York, my sons and I. Two of my sons were living there. And while we were there, we decided to finally, now that Ellis Island renovation has been completed, to go to Ellis Island. And so I was able to find the ship manifest, the boat that my great-great-grandfather George took when he came across from --at that time it was a German port. I've forgotten the—it was one of the standard German ports that people embarked to come to America from, and his name was written in the manifest as George Tvardi, T-V-A-R-D-I. [00:05:04]

T. A. Rosolowski, PhD

[00:05:04] So that's the company later on. [00:05:06]

David Tweardy, MD

[00:05:06] That's correct. [00:05:07]

T. A. Rosolowski, PhD

[00:05:07] Oh, okay. [00:05:07]

David Tweardy, MD

[00:05:07]
So there's a little connection there, and, in fact—
[00:05:10]

T. A. Rosolowski, PhD

[00:05:09] Yeah, there is. Tvardi. [00:05:11]



Interview Date: January 23, 2019

David Tweardy, MD

[00:05:10]

—when we were thinking about what to call the company, and I told Ron DePinho's brother, who was doing our—and still, actually, doing—all our graphics, the story. Coming from New York and knowing his own family story, he thought that was such a compelling story. And I felt proud of that, so I decided that I would go with that, and actually I'm quite pleased with the result. The logo's quite nice, and the whole thing worked out. But that's correct. So Tvardi, which is the original family name on my grandfather's side, then was somehow, from the time of him boarding ship in Germany to arriving in Monessen, Pennsylvania, was morphed to Tweardy. And my guess is it was just—Tvardi is—that "tv"—
[00:06:01]

T. A. Rosolowski, PhD

[00:06:01] Yeah, hard. [00:06:02]

David Tweardy, MD

[00:06:02]

—is just such an unusual combination, if you're Scotch Irish or whatever. So I think just "tw" was a little easier—"tweak," other words that are occasionally seen in this country with a "tw" combination—so it morphed. And the Twardi just became a "di." There are a few people who came—I think must be some distant relatives who you'll see spellings of T-W-O-R-D-Y, T-W-A-R-D-Y, T-W-E-R-D-Y, but that's what happened. It morphed over the course of travel. [00:06:37]

T. A. Rosolowski, PhD

[00:06:37]

Yeah, yeah, and that was so common with those unfamiliar names. [00:06:41]

David Tweardy, MD

[00:06:39]

Absolutely. That's right. In fact, I assumed, because the story's so often retold, is when my grandfather said his name to the official who was recording—I went up to those—if you've ever been to Ellis Island, there's the second floor where everybody went up the stairs and went through all of the lines, and when he gave his name to the individual, the official who was writing the name, I suspect it was transcribed there in a way that he heard it. Anyway, so that's—

[00:07:13]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:07:13] It wouldn't be surprising at all—[00:07:15]

David Tweardy, MD

[00:07:14] Yeah, exactly. [00:07:15]

T. A. Rosolowski, PhD

[00:07:15]
—assimilating it to, yeah, more Anglo kind of—[00:07:18]

David Tweardy, MD

[00:07:18] More Anglo, yeah, terminology, right. [00:07:20]

T. A. Rosolowski, PhD

[00:07:19]

—yeah, yep, phonetics. So tell me more about your family. You said you had a large family. [00:07:24]

David Tweardy, MD

[00:07:23]

Yes, large family. The Ruthenians, religiously and ethnically, are Byzantine Catholics, which is a branch of the Catholic faith that's distinct but unified with the Roman Catholics, but it's kind of a different branch. The creation of the Byzantine Catholic Church had to do with the splitting of Europe during the ninth and tenth century. And as was the order of the day, so to speak, you looked to marry into your religion, so both my parents were the son and the daughter of Byzantine Catholic families. And they, as many families back then, my mother and my dad, we had kids, and we had a total of seven children in our family. I was the fifth of a family of seven. There were five boys and two girls. I was the fifth boy. And I always tell the story that when you're—at your christening, all of your family and friends bring sort of gifts. And I can tell you that the gift number dwindled by the time I was born, (laughter) not that I knew this, but my mother told me. Then, of course, my sister was born, and it went back up—
[00:08:44]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:08:44] Oh, that's so funny. [00:08:45]

David Tweardy, MD

[00:08:45]
—because—and they were all very kind of—[00:08:47]

T. A. Rosolowski, PhD

[00:08:47] Boys were old news. (laughter) [00:08:47]

David Tweardy, MD

[00:08:47]

Boys were old news. I mean, come on. Just give us a daughter, or a niece or whatever. But—[00:08:54]

T. A. Rosolowski, PhD

[00:08:54]

Now, so you were raised in the faith.

[00:08:57]

David Tweardy, MD

[00:08:57]

Yes, I was raised in the faith. In fact, I was an altar boy. I tell the story that I said the high mass. The high mass, if you know anything about the Catholic Church back 50 or 60 years ago, each of the Roman and the Byzantine had a high mass, which is usually the middle of the Sunday day, usually ten o'clock, so that the older people could come, because they're the ones that really would appreciate the high mass. Then the Roman Catholic Church, it was an exchange between the priests and the parishioners in Latin, and in the Byzantine Catholic Church it was Old Slavonic, which was what the Bible was translated into when Cyril and Methodius tried to convert that part of Europe. And so (laughs) the Old Slavonic language is not spoken; it's kind of like Latin. It's like the Latin equivalent for Western Europe countries, because nobody—people stopped speaking it, but they kind of remembered it. Old Slavonic was that way, too -- and so I went and I served at the altar for so many high masses that I could sing—it was a sung mass, too—I could sing the entire mass, only knowing maybe four words. (laughs) But it was really quite beautiful. So I was an active altar boy in the church. [00:10:13]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:10:13]

Is faith still important to you?

[00:10:14]

David Tweardy, MD

[00:10:14]

That's a very good question, and what I tell people now is I lost the gift of faith, and I do believe it's a gift. And perhaps I've just transplanted, if you will, that faith into science. That's kind of what I, in retrospect, like to think.

[00:10:33]

T. A. Rosolowski, PhD

[00:10:34]

Is there kind of a spiritual sense connected with science?

[00:10:37]

David Tweardy, MD

[00:10:37]

Absolutely. I think that the— In fact, the way I now would express that is after I grew up in Western Pennsylvania, of course, with seven kids we all had jobs, and my first paying job was, as a third-grader, eight years old, the paper route was handed down to me, my brother and myself. My brother was just older than me. And so for the next—from third to tenth grade I was a paperboy. And what happened was in the enlightenment—I think there was an enlightenment that went on in this country with the Civil Rights era, women's movement—[00:11:21]

T. A. Rosolowski, PhD

[00:11:21]

The '60s, yeah, '70s, yeah.

[00:11:23]

David Tweardy, MD

[00:11:22]

—and the '60s. And one of the enlightenments that happened is, actually, to refer to the Fall River story, is there was a—many of the paper mills in the country, and clearly the one that supplied the print, the paper from the paper I took, newspaper I took, were in Maine: the Great Northern Paper Company was located in Maine. I think --for sure-- I think it was the motto for John Irving's most recent book. Any event, the owner of that mill decided to open a scholarship program to prep schools in New England, about five—actually started with one and it expanded to about six, that the news carriers for those organizations that used his paper would be eligible



Interview Date: January 23, 2019

for. And so I applied, and the year that I was eligible—I was in ninth grade—or, no, tenth grade—so for my eleventh and twelfth grade I actually won a scholarship to a small school in Western Connecticut called South Kent.

[00:12:27]

T. A. Rosolowski, PhD

[00:12:27]

Wow. Now, this was high school?

[00:12:28]

David Tweardy, MD

[00:12:28]

This is high school. And getting back now to the long, long arc, perhaps, to a story—to the answer to your question, am I still spiritual—

[00:12:37]

T. A. Rosolowski, PhD

[00:12:37]

I trusted you. (laughs)

[00:12:37]

David Tweardy, MD

[00:12:37]

Yes, that's right. This is, you said, nine hours. (laughter) Plenty of time. So as I transferred my faith, if you will, from religion, Catholicism, to science, I think I was able to realize that maybe in clearly—because I was asked to come back to South Kent and give a presentation. They were having—it was probably about 20 years ago. They had a really, really good science program, and they wanted people to come back and talk about things that were scientifically-oriented, and wanted to— I think they thought—they knew I was active in science. So I gave a talk that I really wrapped around a patient that we saw, because you're trying to appeal to—this was an allboys school. So you're trying to appeal to the tastes of teenage kids. So I brought, actually, a jar that had in it a tapeworm, a fish tapeworm. And actually, the fish tapeworm was from the patient my wife had seen in the emergency room in Pittsburgh. And so it was a great show-and-tell. But I wrote an article for that, and it was around what was the appeal to science. And to get back to the faith issue, I titled it "Knowing God's Secrets." And that is the thing that still, frankly, has throughout my career—there's nothing quite in the experiences I have across my administrative, clinical research experiences in everyday life that affects me more and gives me more joy than learning something new for the first time that's never been learned before. And the way I best expressed that was, these are God's secrets. There's only one entity that knows these, and then you discover it, and now you know. You're in on the secret. And so I think I still maintain a faith-based aspect to what I do, yeah.



Interview Date: January 23, 2019

[00:14:59]

T. A. Rosolowski, PhD

[00:14:59]

Absolutely. And that's not uncommon, actually, among scientists to feel that way. And I wanted to say, something I didn't mention before we turned on the recorder, which is if you'd like to provide me with a copy of that or anything else to append to your interview, feel free. [00:15:16]

David Tweardy, MD

[00:15:15]

I wonder if I still—yeah, I think I—actually, I think I did save—it's probably on my home computer, because this was when I was at Baylor—sort of a little file folder that I have, the article and all that. Yeah, I'd be happy to send it. [00:15:29]

T. A. Rosolowski, PhD

[00:15:29]

Yeah, I mean, if you feel that would be an enhancement.

[00:15:31]

David Tweardy, MD

[00:15:30]

I think it's—I think that's—the feeling that I expressed at that moment, I think, has stayed with me, and I think it still rings true, so I think that [would be good?].

[00:15:40]

T. A. Rosolowski, PhD

[00:15:39]

Yeah, I think that's wonderful. I think that's wonderful. I mean, I think it's really—those are important things, I think, because there's a common assumption that people of science have no sense of spirituality at all, and that's very wrong.

[00:15:54]

David Tweardy, MD

[00:15:54]

Oh, that's—yeah. I mean, certainly, you're right. If you look at a—point that to an example of somebody who does not fall into that (inaudible), I mean, it is—in fact, it's really interesting. And I'll just do a little sidebar, if you will, on families, large families. I've become, I think, a self-proclaimed expert on large families, coming from one. I think what you learn is that families are actually consisting of multiple families; that is, the siblings. They break out into groups. And the really interesting thing is my family of seven, my siblings, a family of seven,



Interview Date: January 23, 2019

broke out into three groups. There was the first three, my oldest three brothers, John, Bill, and Tom; then it was the next three, which was Jim, myself, and my sister Susan; and then there was my sister Lynn, who was born eight years later, and you know the story there. I mean, it often does happen. But those were three separate families, almost. The reason I bring it up is that the three of us—my brother Jim, myself, and my sister Susan—we were probably—we were clearly the spiritual ones. In fact, two of them became ministers, one a Presbyterian and the other most recently was ordained an Episcopalian minister.

[00:17:21]

T. A. Rosolowski, PhD

[00:17:21] Wow. [00:17:21]

David Tweardy, MD

[00:17:22] Yeah. [00:17:22]

T. A. Rosolowski, PhD

[00:17:22]

Now, that's very interesting.

[00:17:24]

David Tweardy, MD

[00:17:24]

Yeah, and I didn't go with religion, but I went clearly into the science—[00:17:28]

T. A. Rosolowski, PhD

[00:17:28] Now, was— [00:17:28]

David Tweardy, MD

[00:17:28]

—with the same kind of, I think, religiosity, maybe, if that's a—[00:17:32]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:17:32]

Now, was there something about the way you guys bonded, think—

[00:17:36]

David Tweardy, MD

[00:17:36] Yeah. [00:17:36]

T. A. Rosolowski, PhD

[00:17:36]

Tell me a bit about that, I mean, that little cohort.

[00:17:39]

David Tweardy, MD

[00:17:38]

Yeah, that's a really good question. It's one I've kind of been pondering for a while. And so I think one of the things that—my dad and my mom, they loved each other, and they were just, I think, one of the most effective dyads in terms of team leaders that I've seen.

[00:17:57]

T. A. Rosolowski, PhD

[00:17:57] Their names? Your dad's? [00:17:59]

David Tweardy, MD

[00:17:59] Yeah, John and Helen. [00:18:02]

T. A. Rosolowski, PhD

[00:18:02]

And your mom's maiden name?

[00:18:03]



Interview Date: January 23, 2019

David Tweardy, MD

[00:18:04]

Kotch, K-O-T-C-H. And if you wanted to know the way her name was, it was Tkatch, and, of

course, as you know-

[00:18:14]

T. A. Rosolowski, PhD

[00:18:14] It got modified. [00:18:15]

David Tweardy, MD

[00:18:15]

—that T-K-A-T-C-H, oh, that's impossible, so they just got rid of the T and made it Kotch. And so they were very hardworking, and my dad was fortunate to—he was an electrician in the steel mills, and he was—and this was the early works of U.S. Steel. And because of the fact that that was a leading steel producer, and the unionization movement was taking place, my dad was able to be paid a reasonable salary for what he did. And, consequently, we were all able to have food on the table, clothes, and we never felt like we were poor, except for one year, when the U.S. Steel strike of 1967, I think. That was—I didn't remember sensing things were—my mother was a little tense, (laughs) but other than that... But to my theory of why the three of us -nevertheless, even with what I think was a reasonably happy childhood, with all the things I could have wanted, or pretty much, I think that my oldest three brothers, they probably developed higher expectations because of my dad being successful, and resources were a little more abundant when they were young. And, of course, then we came along, (laughs) and things changed. So, interestingly enough, they're more materialistic. They look at life more from the kind of capitalistic type of— I mean, the oldest owned his own—essentially was a metallurgic engineer, bought a couple companies with a classmate of his, and became a semi-captain of industry, okay. That's the second. The oldest, I should say, became a financial planner. He went into education, computer education, and then, I think, moved into financial planning. The second was the captain of industry. Now, Tom was already on the transition, so it's maybe not fair to break him off, because he went into education, stayed in education, I think just retired about two years ago. But he was kind of a tweener, in some respect, because Jim, myself, and Susan, we really had got completely—we went really a different direction. I think we were just more spiritual. And the—I mean, it's—and, again, it's probably overemphasizing differences, because there's so much similarities. But if you try to answer the question why did, out of these three, were there two ministers and one scientist— [00:21:14]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:21:14]

Yeah, that's evidence. (laughs)

[00:21:15]

David Tweardy, MD

[00:21:15]

—yeah, how do you explain it? And it's just—and because we moved—our emphasis moved from material more to the less material, the more spiritual. I think that's the best explanation I can come up with for that. But it is an interesting one, and—yeah.

[00:21:32]

T. A. Rosolowski, PhD

[00:21:32]

It is. Well, and it's kind of setting value systems really early, and—

[00:21:36]

David Tweardy, MD

[00:21:36]

That's correct.

[00:21:36]

T. A. Rosolowski, PhD

[00:21:36]

—not that yours is better than your older brothers' or your youngest sister, but a different emphasis—

[00:21:43]

David Tweardy, MD

[00:21:43]

Yes.

[00:21:43]

T. A. Rosolowski, PhD

[00:21:43]

—a different focus, and a different way of constructing identity, and those things are all important.

[00:21:47]



Interview Date: January 23, 2019

David Tweardy, MD

[00:21:47]

Yeah, and I think my mother was instrumental in that.

[00:21:49]

T. A. Rosolowski, PhD

[00:21:49] How so? [00:21:50]

David Tweardy, MD

[00:21:50]

Because I think my mother had this amazing—I mean, my mother was, I think, the most emotionally intelligent person I ever met. I mean, she was able to do something which I think is a real feat: she was able to have seven children and have everybody think that they were her favorite.

[00:22:08]

T. A. Rosolowski, PhD

[00:22:08] Wow. (laughs) [00:22:08]

David Tweardy, MD

[00:22:08]

I mean—yeah, I mean, you can imagine that. How hard is that?

[00:22:12]

T. A. Rosolowski, PhD

[00:22:12] Yeah, seriously. [00:22:13]

David Tweardy, MD

[00:22:13]

And I really do—I mean, it would be interesting to get all my brothers and sisters here, but she did that. I think—because there was never any sense that we were less esteemed in the eyes of my mother. My dad was more the disciplinarian, and your esteem is a function of whether you were behaving or misbehaving, but my mother just was kind of a constant in that regard. And because she had an ability to make anything that was maybe—for instance, we weren't able to have everything we wanted, in a way, but she made it work. She made it work, and she made it



Interview Date: January 23, 2019

not feel like we were really in any great want. And part of it was that—this is, frankly, my respect for the Catholic Church: in times that are clearly tumultuous for that organization, but the Church is—you can see how it's structured to reinforce spirituality over the corporal, because, frankly, it's supporting individuals who don't have as much as they would like to have, and it, in turn, makes that a virtue. And I think my mother was incredibly good at doing that. Perhaps because we were—the three of us—Jim, myself, and Susan—were more maybe experiencing that a little more, we received that in our thinking around anything. The downside, we tended to look at the spiritual reinforcement of some deprivation, rather than the actual physical aspects of the deprivation. So I think she was really a masterful person in those two ways: able to spin things in a way that was very positive and spiritual, through a spiritual sort of sense, and then the other is the just emotionally able to have all of us feel that we were really very important to her. [00:24:09]

T. A. Rosolowski, PhD

[00:24:10]

Is there anything else you learned from your mom, just watching her operate? [00:24:13]

David Tweardy, MD

[00:24:13]

Oh, I learned to cook from my mother. (laughter) Really, I love to cook, and I—as the fifth boy, all the outdoor jobs got taken. (laughter) [00:24:21]

T. A. Rosolowski, PhD

[00:24:22]

Right, there we go.

[00:24:23]

David Tweardy, MD

[00:24:23]

So I needed to help out, and, of course, the jobs that were available were more the indoor jobs, and so I was doing the dishes, I was doing—and I watched my mom cook. I—[00:24:33]

T. A. Rosolowski, PhD

[00:24:33]

That sort of gender stuff going on, I mean, did that have an impact on you? [00:24:37]



Interview Date: January 23, 2019

David Tweardy, MD

[00:24:37]

Well, it's funny. It's really interesting. I think you're right: it is gendered. But—[00:24:44]

T. A. Rosolowski, PhD

[00:24:44]

Well, I don't want to put words in your mouth, but I was like, wow, that's kind of amazing. [00:24:47]

David Tweardy, MD

[00:24:45]

No—yeah, but I think there is a biological basis for some of these things, as you know. I mean, if you're older—I mean, it could be a girl or a boy, woman or man, but if you're older you're just going to be a little physically stronger. You're going to be able to handle some of the physically more demanding things. And so I think it wasn't gender; I think it was just age. When we --notice that I said I was the fifth. I said I was the fifth boy, but I was also the fifth child. And frankly, maybe, it would have made a difference if several of my older brothers were girls. I might not have had as much of an opportunity—I might have been kicked out to do the outdoor jobs. But, bottom line, the circumstances were such that I had the opportunity to—I mean, I helped my dad a lot, too. So both of them taught me a great deal. I learned to cook, and just sort of shortcuts. My mother was an incredible efficiency expert. She had to be, I think. But cooking and baking were her just amazing skills, and so I learned that from her, and, just like I say, efficiencies on how to do those things, yeah.

T. A. Rosolowski, PhD

[00:25:56]

Yeah. Well, it's always interesting to see families as a kind of pressure cooker for these things, because I'm already looking ahead to roles that you take on later, and there's a service motive, and there's being an administrator, thinking about how to run operations, and all those things. And you get thrown into these situations when you're a kid, and looking at problems from a particular perspective seem to come second nature.

[00:26:21]

David Tweardy, MD

[00:26:21]

Well, I actually couldn't agree more. I mean, there's that old line from 30 years back, everything important I learned in kindergarten. (laughter) I'm a strong proponent of the fact pretty much everything you learn about interpersonal relationships and how to work with people, you don't have to stop learning them as you grow up and in your family, but you learn a whole lot. I think



Interview Date: January 23, 2019

that has helped me immensely in terms of how I deal with pa—individuals. And, frankly, I slipped "patients," in there, but it's the same thing. I mean, your interpersonal relationships are so influenced by how your interpersonal relationships were when you were growing up, and so—but I, again, I was very fortunate in my parents. They were really very supportive, and made all the difference to us.

[00:27:14]



Interview Date: January 23, 2019

Chapter 02

A Focused Student Intent on Science Education

A: Educational Path;

Codes

A: Personal Background;

A: Character, Values, Beliefs, Talents;

T. A. Rosolowski, PhD

[00:27:14]

Well, that's a wonderful story. Now, tell me a little bit about what was going on with school at this time.

[00:27:20]

David Tweardy, MD

[00:27:20]

Yeah, so it's funny: I was just talking to my brother, Bill. Bill and I always thought --of all of my brothers, Bill and I were the most similar. We both became engineers; at least, we started as engineers. Bill actually graduated as a metallurgic engineer. I ended up enrolling at Princeton as an aerospace engineer, but that was in 1970. You're much too young to remember this, but—[00:27:47]

T. A. Rosolowski, PhD

[00:27:47] You'd be surprised. (laughter) [00:27:48]

David Tweardy, MD

[00:27:50]
But the bottom—
[00:27:51]

T. A. Rosolowski, PhD

[00:27:51]

You're only a couple years older than I am.

[00:27:53]



Interview Date: January 23, 2019

David Tweardy, MD

[00:27:53]

Well, there you go. Maybe you'll remember, although you had to kind of be in the right space, or a certain space. But 1970 is when Boeing started laying off people in Seattle at their plant. So being obviously very pragmatic, partly coming from a large family as an engineer, I wanted to have a job when I graduated. So I switched out of aerospace engineering into chemical engineering, because I really like chemistry. [00:28:21]

T. A. Rosolowski, PhD

[00:28:21]

Yeah, I wanted to actually back up a little bit.

[00:28:23]

David Tweardy, MD

[00:28:23] Yeah, sure.

[00:28:24]

T. A. Rosolowski, PhD

[00:28:24]

Because—how did you track to that? I mean, what was your relationship with biology? I mean, going through all this school, and how were you sort of figuring out this is what I like, this I don't like at all, these are what my talents are, that kind of thing? [00:28:38]

David Tweardy, MD

[00:28:37]

Yeah. Well, that's—so this is something you tend to think about as a lifelong clinician or physician-scientist. You kind of think about, well, how did I get here? What were the influences and forces that led to me to become what I am today in my career? And I would say before you get to the chemistry, or chemical engineering, I guess I was—I think I was just a bit of a—I tell my wife, jokingly, I think I was on the spectrum. (laughs) [00:29:14]

T. A. Rosolowski, PhD

[00:29:15]

Of?

[00:29:15]



Interview Date: January 23, 2019

David Tweardy, MD

[00:29:15]

Of—oh, jeez, I'm blocking. I wanted to say Alzheimer's. This is much too early for that. [00:29:23]

T. A. Rosolowski, PhD

[00:29:22]

Oh, oh, autism, or Asperger's, or—yeah.

[00:29:25]

David Tweardy, MD

[00:29:24]

Yeah, on that, because—and only in this regard: I just knew, even at a very early age, I had this just amazing ability to concentrate and think about just objects and things, and weigh things and balance things and kind of do these things that would be considered incredibly nerdy. But I just was completely fascinated with that stuff. And starting when I was three, and four, I mean, I just—we had these blocks, and I used to like to balance them, make sure they had the same amount of—and I just—and I could just do this. Of course—
[00:30:01]

T. A. Rosolowski, PhD

[00:30:01]

And so that was also probably strongly visual? You have a visual imagination? [00:30:04]

David Tweardy, MD

[00:30:03]

Yes, visual. Yes. In fact, I think that's a really important point, because I think that most scientists—among the very best scientists I know, they have the ability to just immediately understand the impact of something without a lot of—if it's visually presented. And, frankly, also, kind of almost keep that—take that to memory and memorize it, and almost recall that at will in the future—

[00:30:33]

T. A. Rosolowski, PhD

[00:30:33]

How do you see it? Is it forms? Is it symbols? Is it color? Is it not? [00:30:38]



Interview Date: January 23, 2019

David Tweardy, MD

[00:30:38]

Actually, it's more—it's the relation. It's the relationship of one thing to the other. [00:30:44]

T. A. Rosolowski, PhD

[00:30:44] Is it moving? [00:30:45]

David Tweardy, MD

[00:30:46]

Actually, no. I think most of my ability to recognize and absorb information, generally it's static, but it's always relationship-oriented. It's like this is different than this, and it's the differences that seem to be—and when they're depicted simply, but honestly and easily, they just immediately become apparent to me. And it's like in graphs, for instance. I think I just have this thing for graphs. (laughs)

[00:31:17]

T. A. Rosolowski, PhD

[00:31:17]

Does that become part of your own shorthand for communicating with yourself as you're generating ideas?

[00:31:23]

David Tweardy, MD

[00:31:23]

I think it is, it does. In fact, I noticed that as I move into more—as I moved up into more and broader administrative roles, I've had to translate what I think is just so obviously --blatantly obvious into language that I think maybe others would understand more easily. And even now, I have to say even now, as I talk to Ron DePinho [oral history interview] and others, it's like I still find it slightly frustrating that they don't get it, when I think I've explained it in a way that --to me, if anybody explained it that way it would be, boom, I'd get it. So there's kind of like—it's my own—so this is my own internal language that I have to continually remind myself to externalize in order to communicate effectively.

[00:32:15]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:32:15]

Yeah, I think that's—people talk a lot about emotional intelligence versus not, communication across these boundaries, but very rarely do people talk about the gap that's created amongst visual thinkers and non-visual thinkers.

[00:32:27]

David Tweardy, MD

[00:32:27] Yes. [00:32:28]

T. A. Rosolowski, PhD

[00:32:28] And it's huge. It is huge. [00:32:30]

David Tweardy, MD

[00:32:29]

And actually, I'm glad you mention it, because I cannot—one of my—I mean, in addition to building my own career, I have been really interested in growing the careers of those around me. I have mentored a lot of people, not as many as Ron, for instance, has, but certainly a good share. And one of my things I've noticed is that --I had a really outstanding postdoc, who was a pediatrician, but she was a totally verbal learner. And, in fact, so if you showed her the picture, it just didn't click, but if you told her the story and all that, it jus ... And she would—every time she would give presentations, she'd have a great figure on it, but her verbal abilities just really blew people out of the water, because—and she was a verbal learner and a verbal communicator. And, anyway, so she was the first person that I really noticed the difference between she and I, her and I myself, on this particular way we internalized information. She could read a paragraph and it was like—I have to translate the verbiage into a figure, and then I remember. Or, on the other hand, if they gave me the figure, no need to talk about it. [00:33:46]

T. A. Rosolowski, PhD

[00:33:46]

No need to talk. Oh, very interesting. Yeah, no, these differences are huge, and they really do influence—I mean, maybe not outcomes, but they do influence problem-solving styles—[00:33:56]



Interview Date: January 23, 2019

David Tweardy, MD

[00:33:56] Yes. [00:33:56]

T. A. Rosolowski, PhD

[00:33:57]
—and communication. They really do. [00:33:59]

David Tweardy, MD

[00:33:58]

That's right. That's absolutely right. So, like I say, at a very early age I was doing these things, and then, in terms of just playing with blocks, (laughs) and doing things that all kids do, maybe with a little more intensity, I don't know. Then I got into school, and very early on I was just—I guess I was a good reader. I learned to read quickly, and it was pretty much in second grade, the die was cast, because my—(laughs) So my second grade teacher—I'll never forget her, Mrs. Hathaway—she—I was probably, in fact, I still am hyperactive, but you can imagine me as a second grader. I mean, it was like completely. The good news is, for me, I had a stern father, and if I didn't have a stern father, I mean, it would've been (inaudible). Who knows what would've happened to me? Because I think I needed severe limits at an early age. And so in second grade, yeah, I was just so excited by everything, and so I would just bounce around. And so she made me—my desk was right in front of her, but she would let me go back, because in the back of the room there was a series of ten red science books, each with a topic: astronomy, geography, or Earth science, I guess, geophysics, biology. And, of course, I guess I was a quick student, so I'd get through the routine stuff quickly, and I'd be the usual, like, "What can I do? What can I do?" And so she would say, "David, you can go back and take a book." So I read through them, and so by the end of the second grade I did this maybe third, fourth grade type equivalent science. I knew a bit of science across the spectrum of the sciences. And so I knew I wanted to do science. And when she asked me, "David, what do you want to do when you grow up?", I said, "I want to be an astronomer." [00:35:46]

T. A. Rosolowski, PhD

[00:35:46] Oh, yeah, there you go. [00:35:47]



Interview Date: January 23, 2019

David Tweardy, MD

[00:35:47]

There we go. So I was going to be an astronomer. And then it moved to an astronaut, as I got a little older, because it was a combination of ... And I did a lot of sports, so it kind of combined the intellectual, plus the athletic kind of thing. I remember Chuck Yaeger's—or is it—the book that Tom Wolff wrote about the early astronauts—[00:36:14]

T. A. Rosolowski, PhD

[00:36:14] Don't remember the name of it. [00:36:15]

David Tweardy, MD

[00:36:15]

Yeah, but it was this—that was the—and, of course, there was *Sputnik*. The other thing I remember very vividly driving my interest in science was the launch of Sputnik, and, of course, it just lit a fire under -- anybody interested in doing science was even further motivated by the president. All the way—about to get out there and do good science, and make certain we don't let (laughs) the Commies get ahead of us. I mean I was telling my son, I remember when we had air drills and we had to go hide under our desks. And so that was—this Communist threat was not necessarily real, but we were training, we were planning for it, so it was real enough. So the Sputnik, the science orientation, that just really cemented my interest in science. And then it was just a matter of what I would do in science. And, as I say, went through astronomy to astronaut, was too tall and blind to be an astronaut, (laughter) and so check that off the list. And then I used to—and probably the other thing that really cemented it is my dad was an electrician, and having a bunch of kids, I think he wanted to keep them quiet, and not out there—and so he would bring things from the mill that were leftovers that were going to be discarded. They were like neat little things. So my—I probably more than my brothers, because, again, of this visual/tactile thing, I would spend my winters between dinner and bedtime just what my dad would call puttering around in the basement, with all of the things that he had brought home. And I knew I was like, science projects, I just loved science projects. I made a couple science projects, did well at the science fair. I don't think anybody was as interested in science, probably, as I was. (laughs) That was the simple interest. And so that, again, cemented the interest. And then, really, I had some good science teachers, but, frankly, not great science teachers in Monessen High School. [00:38:33]

T. A. Rosolowski, PhD

[00:38:33]

So is there a story with you applying to Princeton from that particular school?



Interview Date: January 23, 2019

[00:38:37]

David Tweardy, MD

[00:38:36]

Yes, so that's what happened. So then it turns out—it's very interesting how things work, and the role of kismet in one's life. So by virtue of being the paperboy in third grade, applying for the prep school scholarship, getting it, going to South Kent, the science teacher at South Kent, who I adored, his father was on the Princeton admissions committee. He would interview and refer kids in to—and give them the kind of recommendations that can get you in. And so I was a good student. I was in the—my timing was good, because there was this sense of social justice being corrected in—and so I got into Princeton. And it was kind of funny, because —I remember some really—individuals with very nasal voices sort of telling me, "Tweardy, what do you think you're doing here?" (laughs) thing. And I went, "Well, I just applied and got in." It was one of those things that I was so—I mean, going to Princeton was a really interesting experience. The prep school already was interesting, because it was the East Coast. You know the phenotype. It wasn't Andover/Exeter, but it was that scale of things. It was a really—it was the perfect school for me, though, because if I was going to go to a prep school from my background, the cultural differences could have been overwhelming. But the fortunate thing about the school was it had a really interesting philosophy. It was "Simplicity of life, directness of purpose" was its motto, and so everybody had a job there. I said, of course you have a job. I had a job at home; I'm going to have a job here. Of course. What do you expect? And sort of it drove—it forced equality in this regard around resources. You got 45 cents for an allowance per week, (laughs) and the candy store where you could use it was open for an hour on Saturday, right before the movie. So, basically, everybody—there were no high-rollers in the school. Everybody was pretty much driven down to a common denominator. [00:40:56]

T. A. Rosolowski, PhD

[00:40:56]

Well, they clearly made some serious decisions about value systems and—[00:41:01]

David Tweardy, MD

[00:41:01] Oh, they did, and this school— [00:41:02]

T. A. Rosolowski, PhD

[00:41:02] Yeah, very interesting. [00:41:02]



Interview Date: January 23, 2019

David Tweardy, MD

[00:41:03]

South Kent was sort of a derivative of Kent, and the reasons South Kent was created was because the principals that were—in 1923, I think it was George Bartlett—not George, actually, Samuel Bartlett, and another gentleman whose name I don't recall, were a little worried about the direction that Kent was taking. It was more—you can imagine in the '20s it was drifting more towards a lack of principles, basic principles, and so that's why they formed South Kent, and they adhered to those through till the '80s. [00:41:41]

T. A. Rosolowski, PhD [00:41:40] Very interesting. [00:41:41]



Interview Date: January 23, 2019

Chapter 03

An Inspirational Friend, Sports, and Spirituality A: Personal Background;

Codes

A: Personal Background;

A: Character, Values, Beliefs, Talents;

A: Influences from People and Life Experiences;

A: Faith;

David Tweardy, MD

[00:41:41]

And it turns out it was a perfect fit for me. And I was looked at as—I was called Harry High School. I was nicknamed—I was, okay (laughs). I always find that I react interestingly to these, because they don't mean anything to me, like Harry High School, and "What are you doing here at Princeton?" So I got into Princeton, but Princeton probably was a little more—there was a little more of a culture clash there, but it was really insignificant, because, fortunately, a friend of mine from South Kent, he and I both matriculated the same year. We were roommates, and he was a pretty amazing dude. I mean—[00:42:23]

T. A. Rosolowski, PhD

[00:42:23] What was his name? [00:42:24]

David Tweardy, MD

[00:42:24]

His name was Louis Rinaldini, from Mendoza, Argentina. His father was actually a scientist at NYU, biochemist, and his mother was a homemaker. He was a remarkable guy, and in many ways I would say inspirational, and so helped motivate me, although, frankly, I don't know how much more motivation I needed. But he was a guy, just—he was a double major at Princeton. He was a mechanical engineer and an architect, which were two of the most difficult majors at Princeton at the time. He graduated and got a job with Philip Johnson in New York, probably among the top three architects in the country, if not the world. Decided not—he didn't like architecture because it didn't give him enough to kind of really sink his teeth into at probably an early stage of his career. Went into the—got an MBA at Harvard, and then—and because he fluently spoke three languages, English, French, and Spanish, he got a job at Lazard Frères in



Interview Date: January 23, 2019

New York, kind of a small, more boutique-y type of Goldman Sachs. And he brokered the deal for the Japanese purchase of Rockefeller Center, and then he basically retired. (laughter) [00:43:48]

T. A. Rosolowski, PhD

[00:43:48] That's so funny. [00:43:49]

David Tweardy, MD

[00:43:49]

It was such a—he's a character. I mean, everybody who went to Princeton knows Louis, knows Louis, and they all have Louis stories. He's just—he's a somewhat larger-than-life guy. And it was just great to go into Princeton with a guy like this. And then, of course, he influenced me there, because I actually was, as I say, I was an athlete, and he was an oarsman. Okay, he rowed as a freshman. I did basketball. I was a walk-on at the Princeton basketball team. And funny story there is—I didn't know this until years later, but there was a guy, Joe Vaevrika, who was also trying out with me. Joe was actually recruited, though; he was not a walk-on. And then while the trials were going on, I, just as a part of getting a rebound, I sort of jumped on the back of Joe Vaevrika, (laughs) being aggressive, trying to get the rebound, and I apparently hurt his back. Yeah, he fell, took a fall, hurt his back, and so he couldn't play that year. And I think, in retrospect, I got his position. (laughs) [00:44:59]

T. A. Rosolowski, PhD

[00:44:59] Oh, wow. [00:45:00]

David Tweardy, MD

[00:45:00]

Sorry about that, Joe. But he then joined the team the next year and made the varsity. I, on the other hand, getting back to Lou, I knew I wasn't going to play for the varsity for about two years, because I actually couldn't play basketball with South Kent. They didn't have a basketball team. So I sort of forego my athletics, in a way, to go to South Kent for the academic experience. I kept up enough skills that I could walk on and make the team, but I wasn't going to play any time soon. So I said, hmm, what am I going to do? So Louis, as an oarsman, the next year he roomed with—in fact, as you might expect, he befriended a bunch of oarsmen, and we all got together in an eight-man kind of double-four suite, and there were five oarsmen. And so I just said, hey, let me try out for crew. And that, again, kismet. It was just the best circumstance,



Interview Date: January 23, 2019

because it turns out crew is maybe the best sport I could have done. It's—if you know anything about rowing—
[00:46:01]

T. A. Rosolowski, PhD

[00:46:01]

Not a lot, just what I've watched.

[00:46:03]

David Tweardy, MD

[00:46:03]

Well, it's one of these (laughs) insane sports, okay. And here's why. They joke—you joke, and you have to put up with it very early—if you're not going to be able to understand how everybody else thinks you're crazy, which is part of the ethos and the attraction of crew, is that who would ever participate in a sport where you had to sit down to participate, and you had to row backward to win. I mean, it's like, come on. And the other thing that that joke doesn't tell you is that for every minute of competition, you train for six hours. So it's like this—the ratio of—people complain about how much training they have to do to participate. There are very few—maybe swimming. Swimming's like that.

[00:46:45]

T. A. Rosolowski, PhD

[00:46:45]

So why—how—what are the ways in which that sport and that scenario was significant for you at that time?

[00:46:53]

David Tweardy, MD

[00:46:52]

Yeah, yeah. Well, I think what rowing taught me like no other experience, really, was the limits of one's capabilities, and how to expand those limits. The physical exertion—I thought I was in great shape, because I played basketball, I went running a lot, and I could run three, four miles if I just wanted to. And remember, this is a time—people were not running back then. It was not one of the things people did. They were working—
[00:47:23]

T. A. Rosolowski, PhD

[00:47:22]

No, because you were at Princeton in 1970, you went?

[00:47:25]



Interview Date: January 23, 2019

David Tweardy, MD

[00:47:25]

Yeah, '70-'74. It was not a thing that people did, even—so I thought I was in good shape, but then I started rowing, and that's a whole different dimension. That's a whole different level. So I—I mean, the amount of times I would go to—I would come back from crew practice, eat, and go to sleep, just because I was totally exhausted, was amazing. But what I realized is the payoff was you just became amazingly in great shape. And so I think what it taught me was a lesson on the physical side of athletics, and the physicality of people, is just there are really no limits to what you can do, if you just pay a price. The price there was just tremendous fatigue, tremendous pain, actually—or I shouldn't say tremendous. But the thing about rowing, and if you've talked to any elite athlete or exertion athlete—long-distance runners and aerobic exercisers—is you have to put up with lactic acidosis. It's the phenomenon that you can't—the muscles can't clear the lactic acid quickly enough, and that causes pain, because the body knows—and because you're actually causing muscle damage when that happens. And so you have to learn to be a little bit tolerant of pain, and dose it, almost. And so rowing, for instance, a 2,000-meter race, you're rowing pretty much at your threshold of pain for six minutes, and that's—it sounds a little interesting, and, in fact, I've told people one of the things I've noticed in the last 40 years is masochism has gone really out of style. (laughs) It used to be more a part of my—especially about rowing. I mean, rowing had a real streak of that, because in order to get better you had to just—you had to go through—walk on fire a little bit, and this walking on fire was to exercise to exhaustion, and to muscle pain. [00:49:25]

T. A. Rosolowski, PhD

[00:49:26]

Well, is there something else going on at the same time, though, in the experience? I mean, here you are. You're rowing. You're in this situation with a group of other oarsmen. You're outdoors. You're in the water. It's the scenario. And you're experiencing pain. But what else is going on?

[00:49:41]

David Tweardy, MD

[00:49:41]

Oh, yeah. I mean, there is a whole lot more. It's a social group. I mean, as I mentioned, five to six of the guys in my eight-man suite, if you will, were oarsmen. So there was a lot—there was a great support system for it. It's funny to talk about it as support because we really did not seem to be supporting each other, but it was there. I mean, you're almost more giving each other a hard time whenever the opportunity came up, but frankly you were forming a support network for each other.

[00:50:12]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:50:11]

Well, and there's that whole phenomenon of when you're in the moment of something like that, and psychologists talk about that experience of flow, when you're sort of operating—[00:50:20]

David Tweardy, MD

[00:50:19]

Oh. Ah, yeah. Well, so that's the minute that you're training for, you're training six hours for. There is—yeah, so the part I've emphasized is what you learn about yourself, and what you can achieve if you put your mind to it, in a physical realm. The other thing that is very important is that there are these moments—ecstasy comes to mind. It's kind of a strange word, but where—in fact, the only book that I've read that captures this is a book that was written about five years ago. The Boys in the Boat was written about the 1936 University of Washington crew that won the gold medal in Berlin. It's one of several other stories. The important—of course, the highly touted and very important story was Jesse Owens in that Olympics. It was his Olympics. But the other story, this phenomena was the fact that a high school—or, sorry, a college crew went and beat the world's finest oarsmen—Italy, Germany, etc.—in the Olympics. And in that book, the writer, who's not an—I don't think he was an oarsman, but he was interviewing the last surviving member of that team, and he wrote a book around it, because the story around that guy is—there's some parallels to my own life, although he had a much harder childhood. I think he came from a much more split home, etc., but he prevailed. But the moment when eight men, or eight women, or eight men and women, are in a boat, and the synchrony is spot on. There is this—it's called swing. The phenomenon gets you to that point of perfect ecstasy on a boat is called swing, where everybody's moving up to the catch at the exact same time, their weight's distributed evenly, and they're all centered, and then they hit the stroke at the same time, they finish at the same time, and it lasts, for the most part, maybe—it can last maybe six to ten strokes, but it is like nothing else. It's like discovering God's secrets. It's— [00:52:35]

T. A. Rosolowski, PhD

[00:52:35]

I was going to ask if there was a spiritual connection. [00:52:37]

David Tweardy, MD

[00:52:37]

Yeah, there is no que—I think part of it—I think you probably can appreciate this, having talked to lots of people, but I always remember Willa Cather's quote from I think her first book, which is, "There are many life stories, but they each go on and occur as if they've never happened before." I think there are so many events that we kind of try to bring together and try



Interview Date: January 23, 2019

to coalesce around, and I think spirituality is one way we do it, because words sometimes can't handle it. And so you're right: it's a spiritual moment, because in that instance it's like—it's not you in the knowledge, you in the discovery; it's actually you and seven other people are achieving this moment that's—I think it is spiritual. In fact, sport—and that's, frankly, maybe why, sports became important to me, because I think just as new discoveries can capture a spiritual moment that is difficult to reproduce, but you try to reproduce it. But sports also --I vividly remember moments like that. I remember seeing things that are miraculous in sports. For instance, my freshman year—I've told this story so many times, just because it's so meaningful to me, but the one thing about getting close to being an elite athlete—and I would say I was close; I wasn't an elite athlete—but you have the exposure to elite athletes. For instance, when I was an oarsman in my sophomore year, I trained with a guy by the name of Pete Raymond, who was the two man in the Olympic eight-man shell that won the silver medal in the '72 Munich Olympics. His physical condition was just unbelievable, and it was just—knowing what he did in a day of workouts, and you compare it to what you did, is like a whole different, almost a whole different species of person, or of human.

[00:54:43]

The story, though, of this spiritual moment I had in basketball was there was a guard by the name of Brian Taylor. He was a sophomore. The freshman team, back in the years that they had freshman teams, would scrimmage against the varsity when both teams were at home on Saturday morning. And so at one scrimmage—I'll never forget it—I was a forward, a small forward, and I was guarding the guy who ends up leading it, who was starring on the freshman team. And the other guard, who wasn't supposed to shoot—he was actually the point guarddid take a shot. He went over towards the rim, hit off the back of the rim, and as you probably have seen it careens off over and hits the back, careens over. And I turned, because I thought I had a shot to rebound. I knew where the ball was going. I was heading for the wall. And then all of a sudden, appearing out of the periphery of my eye, is this waist, a pair of shorts. (laughs) And I stopped, because I was going to probably collide with it. And it turns out Brian Taylor had basically—saw what was happening. He also wanted the rebound, but he had abilities that were like I would never, ever have in a lifetime. He jumped from the foul line, and because the ball was coming over the paint he was able to grab the ball about two to three feet above the rim and jam it, having jumped from the foul line, 15 feet away. And so I just, like, suddenly bird's eye view, maybe groundhog's view, and I just-it's like, it's a miracle. It's the first time I'd ever seen anybody do that, even the pros, or—and be that. So sports does have the ability to give you spiritual moments that are pretty much unique, that you'd never have experienced before, and that's one of them. So sports and science, I think, did do that, and along with other things. [00:56:44]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[00:56:44]

Well, it'd be interesting to pick up some of those themes as we go into other areas, because it obviously has a lot of connection to how you feel about working on teams and a lot that. Yeah, so we get a spirituality interview. How cool is that? (laughter) [00:56:57]

David Tweardy, MD

[00:56:56] Yes. Yes. Go figure, right? [00:57:00]

T. A. Rosolowski, PhD

[00:57:00] Well, it's following the story. [00:57:03]

David Tweardy, MD

[00:57:03] Yes. [00:57:03]



Interview Date: January 23, 2019

Chapter 04

"Thinking Like an Electron" in College: From Engineering, to Chemistry, to Molecular Biology

A: Educational Path;

Codes

A: Character, Values, Beliefs, Talents;

A: Personal Background;

A: Professional Path; C: Evolution of Career;

A: Inspirations to Practice Science/Medicine;

A: Influences from People and Life Experiences;

D: Understanding Cancer, the History of Science, Cancer Research;

T. A. Rosolowski, PhD

[00:57:04]

So I'm interested, kind of going back to college, maybe more on the academic side, and seeing that questioning of your original commitment to a major, and how that morphed over time. So what was the academic environment at Princeton like? How did it suit you? How did it help you unfold?

[00:57:26]

David Tweardy, MD

[00:57:26]

Well, I think it suited me really, really well. I went to Princeton as an engineer, as I mentioned to you, and I liked my engineering courses. It was pretty grueling. Engineers had to take five courses a semester, and in addition I was playing basketball, and I was on scholarship, and so I also had a job. So I was busy. The academics were rigorous, but because I—I thought my instructors were excellent. I thought they were the most brilliant people I'd ever met at that point. And I really loved the material. I really tried hard. And the story—(laughs) But the funny thing is because I was so busy, I couldn't keep up. There's just—let's be flat honest here: I could not keep up. I was involved in too many things—the three things: academics, sports, and a job. I wasn't really that socially active. I mean, I—and my role, even starting when I was in college, is I would take one night off a week. Otherwise, I'd just get buried, okay? So I realized that early. I didn't have this adjustment problem I think that some kids have when they go to school, in part, I think, because I went to South Kent. I think two years at South Kent really prepared me for being outside the family, and taking responsibility for myself, not letting it sort of go to my head in a way. But the thing that saved my hind end, to use a phrase my parents might use, is that Princeton had the great wisdom to do its finals after the holiday break.



Interview Date: January 23, 2019

So you would work and take classes till the break, and then you'd take your two- to three-week break, and then you'd come back and you'd do your exams, and then you'd have a week semester break, and then you'd come back and do your second semester.

[00:59:43]

So what did I do for those two weeks that I was home? Well, (laughs) I used to study, eight, twelve—eight to ten, ten hours a day, and that's how I learned the material. That's how I basically passed and, in some instances, did really well on tests. Basically it was just a reflection that I'd mastered the material, because I—and it was because of that two-week break that I—I mean, I would participate in holiday stuff, but ... (laughs) So we had this—my family laughs because there was a walk-in closet that my dad modified to have a desk in it. So that my oldest brother, who went to college first, could come home and have a place that he could actually do some studying that was quiet. He comes home, and there's six kids at that time—well, five other kids running around, and how is he going to find a quiet place? So that was the desk I used, and I studied constantly over that 12—and so that was my saving. That saved me. And, frankly, I guess the other thing, it made me realize that I liked that quiet contemplation and the learning and mastery of the material. I think that students are not born; I think students develop over time. And I think that was the experience, to me, that really made me realize—it's like the crew experience from my physical side, that if you really wanted to become fit and really achieve something athletic, you had to work hard at it and pay a price. Well, I think that's the same thing in the academic world. If you're going to master a body of material, you're going to have to spend the time it takes to master it. And I think that first semester, second semester—and by the time I was a sophomore, I really had learned that well. I mean, I—and so the academic—I became very much an academician. I think you probably remember, having done your thesis? It's not a trivial thing. (laughter) And there's some point in your travels towards that that you realize you're going to do the academic thing, and you're going to have to do certain things that maybe some of your classmates aren't doing. [01:02:07]

T. A. Rosolowski, PhD

[01:02:07]

Absolutely. I remember my dad telling—and I rarely tell personal stories, but this one is very appropriate—I remember my father telling a story about a guy he knew who was all but dissertation and then abandoned it. And I remember when he told me—I was in high school—I had no understanding or appreciation for what that meant, but then, of course, when I went through my own—and I think anybody who's gone through a PhD program suddenly learns, oh yeah, there are any number of moments when you think, I don't know if I can push this through to the end.

[01:02:34]



Interview Date: January 23, 2019

David Tweardy, MD

[01:02:34] That's right. [01:02:34]

T. A. Rosolowski, PhD

[01:02:35]

And you have to muster up whatever it is, whatever resources you have to push through. [01:02:39]

David Tweardy, MD

[01:02:38]

Yep, yep, yep.

[01:02:40]

T. A. Rosolowski, PhD

[01:02:40]

And that's where I think you discover if you're an academic or not.

[01:02:42]

David Tweardy, MD

[01:02:42]

Exactly.

[01:02:42]

T. A. Rosolowski, PhD

[01:02:43]

I mean, sometimes you can just do it because—I always say the best dissertation is a done dissertation, (laughter) but do you enjoy the process—

[01:02:51]

David Tweardy, MD

[01:02:51]

Yes.

[01:02:51]

T. A. Rosolowski, PhD

[01:02:51]

—or do you want to have written it, or do you enjoy writing it?

[01:02:54]



Interview Date: January 23, 2019

David Tweardy, MD

[01:02:54]

That's right, and it's all about the journey. And that's where I say --as I say, sitting in that tiny, little desk in the closet, with, literally, we're talking—you would laugh if you saw what (laughs)—

[01:03:04]

T. A. Rosolowski, PhD

[01:03:04]

I hope you have a picture of it.

[01:03:05]

David Tweardy, MD

[01:03:05]

I should've taken—oh, you know what? I don't.

[01:03:07]

T. A. Rosolowski, PhD

[01:03:07]

That'd be so great, but—

[01:03:08]

David Tweardy, MD

[01:03:08]

That's a really good point, because now in retrospect I go, how could I possibly have spent hours upon hours? But anyway.

[01:03:16]

T. A. Rosolowski, PhD

[01:03:16]

Well, your kids would love to see it, and your grandkids.

[01:03:18]

David Tweardy, MD

[01:03:18]

Yeah, yes, they might. (laughs) On the other hand, having three boys, they're still—they don't—they still tend to like to throw hand grenades at their dad's stories. But that's where I learned. I think that's—and even at the moment, I knew that. I knew that having actually—being able to do it, not going bananas, I think made me realize I had the motivation and the interest and the desire to do something academic.

[01:03:48]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[01:03:48] And there's a pleasure in it. [01:03:49]

David Tweardy, MD

[01:03:49]

Oh, it is. That's exactly right. It's the discipline. It's the—obviously, it's—and, again, the athletics and the academic parallels—the thing you learn is you can't bite off too much. You need to know what is an aliquot that you can handle. You pick that, you master it, and then there's the satisfaction of having done that. Same thing with your athletic endeavors. You can't try to bite off more than you can chew, because all you do is you hurt yourself and you disincentivize yourself. That risk/reward cycle has to be fine-tuned, and I think that's what I learned in college. I think—
[01:04:27]

T. A. Rosolowski, PhD

[01:04:27] Yeah, that self-management stuff. [01:04:28]

David Tweardy, MD

[01:04:28]

Self-management, and how to reward myself when I did do something, and do it in a way that's much more frequent, frankly, than the tests, because you had to make this work every day. [01:04:38]

T. A. Rosolowski, PhD

[01:04:38] You do. [01:04:38]

David Tweardy, MD

[01:04:39]

So that was—so I was very, like I say, fortunate to be at a place where they took ... And the other thing I have to say—this is really a very important point—is that Princeton really respects the opinions of their students. They really want to know what you think. They really want to make you work to express your thinking. And they eschew the multiple choice questions. They always go essay. And they really want you to be able to absorb, digest, and even reconfigure a body of work, and then come up with and apply that to a question that hasn't been asked before, necessarily. And, in fact, you do a thesis at Princeton as a senior, and so they—that experience



Interview Date: January 23, 2019

was—again, that probably culminated that process that I've been describing of my wanting to be an academician, and it just culminated in my senior thesis. And, again, Princeton is a unique place, in my mind, obviously—and tell me to shut up when you want, (laughs) when I go overboard. But they save the thesis of every graduate, and you can go see it. So my 40^{th} —yeah, No, 30^{th} , 35^{th} reunion, which is a whole darn thing, I could go to McCosh and ask at the front desk, "Please pull out my thesis," and wait for ten minutes, and they would, and I could see it. And it was like (laughs), it was the most humbling experience, because it was—the amount of time I put into it—it's not a PhD thesis, but your whole senior year kind of focuses on that. You do your other stuff, but then the focus is on thesis. And it is—that, even though it was mediocre, it was just—it just, again—it just made you realize they respected you. They think this time you're putting in is worthwhile. They think you are worthwhile, and not—in terms of the intellectual effort you can put forth. And I have to say, some of those theses—and kind of every now and then they'll come up with the ten top theses—they're amazing. I mean, some of them are just amazing, what the kids can do. So I think Princeton, as you can tell, we're a really good match.

[01:07:08]



Interview Date: January 23, 2019

Chapter 05

Medical School Leads to a Research Focus on Cytokines A: The Researcher;

Codes

A: The Researcher;

A: Character, Values, Beliefs, Talents;

A: Personal Background;

A: Professional Path; C: Evolution of Career;

A: Inspirations to Practice Science/Medicine;

A: Influences from People and Life Experiences;

C: Patients, Treatment, Survivors;

C: Mentoring; D: On Mentoring;

A: Definitions, Explanations, Translations;

A: Overview;

C: Discovery and Success;

T. A. Rosolowski, PhD

[01:07:08]

Yeah. What about the decision to go to medical school? When did that come in? [01:07:12]

David Tweardy, MD

[01:07:11]

Yes. That's a really good question. So here I was, I started as an aerospace engineer, and who knows: if the market were doing better—I should say the aerospace market were better—in 1970, I could've been happily ensconced at Boeing and designing airplanes or whatever. But then what happened is in the course of my freshman year I had to take two engineering-level basic sciences: one was physics for engineers, and chemistry for engineers. And while I really, really enjoyed the second semester of physics—I still think Maxwell's equations are one of the greatest collective inventions of mankind; I think they rank up in the top five—I really enjoyed chemistry more. And so I said, okay, I'm not going to do aerospace engineering; let's go with the chemical engineering. So I moved into chemical engineering for my second year. And then I came into the harsh realization that, as a chemical engineer, I had to take partial differential equations. (laughter) And so my fall semester I took linear algebra, and that was my—I had two really amazing academic—well, not amazing but embarrassing academic experiences at Princeton. One was linear algebra. It's the smallest book. It's literally no more than maybe 50 pages. It's orange. And you basically—(laughs) it was like I was loaded up so much in that semester I essentially went to no classes. And so, of course, midterm, I studied as hard as I



Interview Date: January 23, 2019

could, and I got a C on my midterm, and I went, oh, no. I said, this is not looking good. (laughs) But I didn't change my ways. I didn't go to classes again. I never did homework. And then I just put this incredible sprint on so that I took the final, I got a B, high B, and I ended up getting a B-minus for the final grade.

[01:09:15]

T. A. Rosolowski, PhD

[01:09:16]

Yeah. Yeah, you were lucky you did that. That's testimony to you. (laughs)

[01:09:19]

David Tweardy, MD

[01:09:19]

Well, it's panic. But then, after that was partial differential equations, and I went, I don't know, this is not fun. I'm not having fun here. So I said, let me move out of chemistry, chemical engineering. And I had done organic chemistry that fall, and I just nailed organic. I just was—I could think like an electron, at one point, so I knew exactly where electrons wanted to go. (laughter) And organic chemistry—I told my son this, I said, "Organic chemistry is just thinking like an electron. Where would you like to hang out? What's the lowest energy state that you can achieve? And then you just work through all of those energy states, and that's how organic chemistry works." And so I have to say, if you ask anybody of my generation that went to Princeton and took organic chemistry—Lamar Jones—there was ... Sorry, Maitland, Maitland Jones is the teacher who taught organic chemistry first and second semester, and Maitland—Welsh, I think, name—was just the most gifted teacher I've ever seen. I mean, he could go up there with multiple colored chalk, and this is back when they used the chalkboards. He would give these lectures, and it was, like, magical. So Maitland just turned me into a chemist. After that, I said bye to chemical engineer, bye to engineering; I just love the chemistry.

[01:10:41]

So I moved into chemistry. And then this is the beginning of biochemistry at Princeton. And I loved the chemistry, but I really loved the organic. I didn't like the—I didn't really care for inorganic, so I never took inorganic, and so I moved into biochemistry and biology, cell biology. And then I had a very influential friend, a very good friend of mine, who we did the thesis together in Biochemistry Department. There was a remarkable biochemistry department at Princeton, it turns out. It was a sub—it was not a depart—I should say it's a section of the Chemistry Department. They didn't name it a separate department at that point, but the chief, if you will, of that section was Bruce Alberts, and Bruce Alberts probably is one of the most gifted biochemistry teachers on the planet. He became so noted for—he did research, very solid research. Went from Princeton to UCSF, and ended up being the President of the American Association for the Advancement of Science, was the editor of *Science* for five years. But amazingly enabling. Again, from the point of view of—Maitland was incredible in a lecture hall,



Interview Date: January 23, 2019

but in small groups this guy was unbelievable, and gathered around him some amazing luminaries in the Department of Biochemistry—in chemistry. I mean, my actual thesis advisor was Mark Kirschner. Mark was just recruited from his—he'd just done a postdoc, and he had nobody as a thesis advisor, so I latched onto him and he was a phenomenal mentor. But then there was Art Pardee. I mean, the names of people there— Uli Laemmli. People have forgotten this, but Uli Laemmli, L-A-E-M-L-I [sic], Uli developed this methodology of separating proteins so that you can determine their molecular weight, and a mixture of proteins. He developed a Laemmle gel, SDS-PAGE gel system. And during this early '80s, mid-'80s, he was the—his article in *Nature* was the number one most cited article in the universe. And he was actually at Princeton, and the second apparatus was ever made on the planet was made for me to do my senior thesis project. (laughter) So, I mean, here I was, again, kismet. And I would run these gels day and night. And then there are a couple other—there were a couple—Arnold Levine, a very well-known guy around p53 was in that department. I mean, just incredible people. Each one of them went on to become a member of the American Association of Advancement of Science, and several of them became members of the National Academy of Science. I mean, it was just amazing how good—and they were small, it was a small department. It was like six or eight people.

[01:13:56]

T. A. Rosolowski, PhD

[01:13:56]

But these are all people who were really, really focused on the research—

[01:14:00]

David Tweardy, MD

[01:14:00] Right. [01:14:00]

T. A. Rosolowski, PhD

[01:14:00]

—(inaudible) research side, so—

[01:14:02]

David Tweardy, MD

[01:14:02]

Right. That's right. So how did I get into medicine? So here I am. I stayed at Princeton during the summer to work on my thesis, because between junior and senior year I worked in Mark's lab. I was going to apply in the fall to PhD programs in biochemistry. Then I met a really cool person. Actually, her name was Judy Wasserheit, who was very well—very successful in



Interview Date: January 23, 2019

medicine. And I got to know her well, and she kind of talked me—she told me or made me think about medicine as an alternative. Her mother—[01:14:37]

T. A. Rosolowski, PhD

[01:14:37]

Now, was she an MD?

[01:14:38]

David Tweardy, MD

[01:14:38]

No. No, she's not. Yes, yes, yes.

[01:14:40]

T. A. Rosolowski, PhD

[01:14:40]

Okay, but then—

[01:14:41]

David Tweardy, MD

[01:14:40]

At that time she was a classmate.

[01:14:42]

T. A. Rosolowski, PhD

[01:14:42]

Oh, a classmate, okay.

[01:14:43]

David Tweardy, MD

[01:14:43]

Yeah, she was one of these Manhattan whizzes who skipped at least one grade in high school, came into college, skipped actually a grade in college, as well, and moved up, actually, to our year, my class of '74. And her mother was a podiatrist, Elizabeth Roberts. And she, I think, really inculcated strongly the value of education, but also a thought about becoming a physician. And I was just the fortunate (laughs) recipient of her discussions around medicine, why she wanted to do it. And so I wouldn't say reluctantly, but I said, yeah, I think—I had a physician, I actually had a—I have a bicuspid aortic valve, that obviously I've had, since it's congenital, and my doctor ... It's just one of these—again, you think about it, as a child I was very healthy, but I remember my doctor telling me, "Hey, you have a heart sound," when I was like ... And then he said something (laughs) which endeared me to him forever—endeared him to me, I should say,



Interview Date: January 23, 2019

forever—which is he said, "You have an athletic heart." And that was because I had a low heart rate, and below 60 is athletic, and then below 40 is elite. And so I said, "Yeah, yeah, thanks, doc! I have an athletic heart! Yay!" (laughs) And so I always had a good relationship with doctors. Of course, I didn't have much of a relationship with doctors, but that was enough. And so when she started talking about medicine, and I started thinking about what I was going to do with my life, I had a—so I said, "Yeah, I think I'll apply to med school instead of graduate school." And I think my mentor, Mark Kirschner, never forgave me for that. [01:16:30]

T. A. Rosolowski, PhD

[01:16:30]

I was going to ask how they responded.

[01:16:32]

David Tweardy, MD

[01:16:32]

I actually think he never forgave me for that, in a way, at a certain level. And I—it is what it is. And, frankly, I have sort of done one of those things that are not that common anymore but the physician-scientist track, where I actually practice medicine but also maintain a very active—[01:16:52]

T. A. Rosolowski, PhD

[01:16:52]

But that was a very new idea.

[01:16:54]

David Tweardy, MD

[01:16:54]

You know, it is new in some—you're right. Lewis Thomas, it turns out, *The Lives of a Cell*, he probably guided me in that regard. I still quote him in the lectures I give. I still give a couple lectures (overlapping dialogue; inaudible)—

[01:17:11]

T. A. Rosolowski, PhD

[01:17:11]

I taught his essays.

[01:17:12]

David Tweardy, MD

[01:17:12] Did you? [01:17:12]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[01:17:13] Yeah. Yeah. [01:17:13]

David Tweardy, MD

[01:17:13]

I mean, he is a brilliant guy.

[01:17:14]

T. A. Rosolowski, PhD

[01:17:14]

He's a brilliant, brilliant writer.

[01:17:15]

David Tweardy, MD

[01:17:15]

Yes, extraordinarily good writer. In fact, his phrase that I use in my lecture is: "And the body reads gram-negative bacteremia as the very worst of bad news." (laughter) It's just brilliant. I mean, I love that turn of phrase. And so when I talk about sepsis ... I give lectures in sepsis, and I still use this, 1974 Lives of a Cell. Anyway, but I think you're right, it was not that common a path. What most people, MDs have done is they get the MD training. It gives them a real perspective around human biology and disease, and then they, like Ron [DePinho; oral history interview], basically just kill it on the science side, never practice. Two of my classmates at Princeton did exactly that. In fact, the second thesis advisee that Mark had was a guy by the name of Dan Littman, and he did just that: he got an MD/PhD in immunology, and then just stayed in the research, and became a Howard Hughes. Bob Siliciano, he stayed as a chemistry major. (laughs) He was a really nice guy. He went on, went to—got his medical degree at Hopkins. I don't think he actually got a true PhD, though. And then worked in AIDS, and became a Howard Hughes. So, very successful track. I, like I say, I just love—I ended up loving medicine, but I love research. So I did the dual MD/PhD. I never—oh, I'm sorry, the physicianscientist. I never got a PhD, because, in a way, as you can tell, I was tracking towards that PhD. I didn't get it, but I kind of felt, because of my senior thesis at Princeton, and I did a couple postdocs. I did a postdoc in infectious disease with Jerry Ellner and Ed Case, and then I did a second postdoc in molecular hematology, in particular cytokine, hematopoietic cytokine biology and molecular biology, especially, with Giovanni Rovera. I kind of—and I thought, what am I going to get a PhD for? I'm ready to start my career. And so I didn't get the PhD. But it was Judy, and good experience with my doc when I was growing up, Judy who really made me realize that medicine can be done, as well as research, or research can be done in the context of medicine.

[01:19:50]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[01:19:50]

So was it mostly—? Were you thinking about it in terms of a research environment? I mean, what about the patient care? How were you factoring that part?

[01:20:00]

David Tweardy, MD

[01:20:00] Yeah. [01:20:00]

T. A. Rosolowski, PhD

[01:20:00]

Or was that not really something you were thinking about at that time? [01:20:03]

David Tweardy, MD

[01:20:03]

No, it turns out—at that time—so I think I approached my medical school career more as a guy who loved the science. So I was one of those rare medical students who loved the first two years (laughs) of medical school. I did. But, again, I just ...Because of the patient-orientedness, and the human-orientedness of medicine, I—who knows? I could've done just what Bob Siliciano did, what Dan Littman did, which is get my MD and then use that as a great base of knowledge around human biology to then really attack a problem full-bore, as a PhD would, and go deep and do the deep dive. But when I started doing my clinical rotations, I just loved that. I just loved the medicine part.

[01:21:03]

T. A. Rosolowski, PhD

[01:21:03]

Now, let me just say, for the record, you were at Harvard Med, and it says you have an MA and an MD. How did that—?

[01:21:10]

David Tweardy, MD

[01:21:10]

No, I didn't get (overlapping dialogue; inaudible)—

[01:21:12]



Interview Date: January 23, 2019

T. A. Rosolowski, PhD

[01:21:12]

Oh, no, that's like—[So I?] probably didn't—

[01:21:14]

David Tweardy, MD

[01:21:14]

Yeah. No, I never got another deg-well, I did not get a degree in addition beyond-

[01:21:19]

T. A. Rosolowski, PhD

[01:21:19]

You know what? I bet I didn't erase all of the Boston, and it's probably the acronym for Massachusetts.

[01:21:25]

David Tweardy, MD

[01:21:24]

Massachusetts, yeah, yeah.

[01:21:25]

T. A. Rosolowski, PhD

[01:21:25]

That's it. So, MD in medicine, and you got your MD in '78?

[01:21:29]

David Tweardy, MD

[01:21:29]

Yes, that's correct.

[01:21:30]

T. A. Rosolowski, PhD

[01:21:30]

Okay. Okay, cool. So you went right from Princeton to Harvard Medical School and then did all that. So tell me about—you have the study-study-dissect-things first two years, and then you have your clinical rotation. So tell me about the kind of feel of those two parts of med school for you.

[01:21:47]



Interview Date: January 23, 2019

David Tweardy, MD

[01:21:47]

Well, I love the first two years. I just—that was kind of a continuation of what I was doing at Princeton, learning the sciences, and I really—

[01:21:54]

T. A. Rosolowski, PhD

[01:21:54]

What about getting into the anatomy lab, though, and doing all that get your hands in the body thing?

[01:21:58]

David Tweardy, MD

[01:21:59] Well, it was not— [01:22:01]

T. A. Rosolowski, PhD

[01:22:02] It's tactile. It's visual. [01:22:03]

David Tweardy, MD

[01:22:03] It's tactile, yeah. I guess— [01:22:04]

T. A. Rosolowski, PhD

[01:22:04] But not— [01:22:04]

David Tweardy, MD

[01:22:04]

Yeah, it didn't—it didn't turn me—it didn't sort of appeal to me as much as the process of biochem. I already came into medical school with a process-oriented and a chemical orientation, so anatomy was something I had to get through. It was not something I found especially stimulating. So it just didn't work for me like the biochemistry did, and understanding how—and the chemistry in biochemistry. So, in a way, what I'm doing with the company Tvardi is really a direct connection to that. I always was interested in chemicals and structures and chemical space, and how they interacted with macro molecules, and proteins are just by far the



Interview Date: January 23, 2019

most interesting macro molecules. They just—we're all sitting—we're all a collection of proteins that are carrying out a series of incredibly important functions --I just—in a cellular context. So, in fact, when I had to figure out where I really was excited about science, I loved cell biology but I really in the end think the cell is a little too complex. I like just the proteins, how they interact, and how they interact with the small molecules, perhaps. I wasn't—that wasn't my forte when I started in science. I was in the real truly serious part of my career. Cytokines is where I started. So the notion of a protein circulating, binding to its receptor, and telling a cell, signaling the cell to do something different, or even do what it was doing even better, that just appealed to me. So, again, it was the biochemistry of it, and I think it was from Mark. I did really—Mark had a huge impact on what I—in terms of what I thought were really interesting questions. In fact, the entire Biochemistry Department at Princeton had a deep and long-lasting effect on what I thought was cool with science, 'cause really in the end it's got to be cool. Otherwise, what's the point? You can do other things.

[01:24:25]

I mean, that's one of the things: I've been very, very fortunate around my career. And a lot of it is serendipity and kismet, but I, frankly, have been able to survive with a mentality that if it's not fun or cool, do something else. And that's not—I don't know if a lot of people can necessarily say that. Maybe they can. I hope they can. But it's just one of the things I've been able to do. But that issue of proteins interacting with proteins to change what happens to a cell is what absolutely became a real focus of my work. And even that was serendipity, because the thing that really got me interested in that particular issue of cytokines was kind of a funny story, which is—not a funny story, but an interesting scientific story-- which is this is the very beginning of the molecular cloning revolution, where people—scientists—Maniatis, I think, probably deserves more credit for being the kind of—the person whose book—it was Maniatis's book—it was Maniatis's *Molecular Biology*, or *Handbook*—that's it—it was the *Handbook of Molecular* Biology. He basically took this—all of molecular biology and made it accessible for you to do it in the laboratory, and it was very practical. It was almost recipes for buffers. And so I happened to be—and after my first postdoc, I got ahold of a cytokine that was molecularly cloned, using Maniatis's—well, using the techniques that are in his book. I was—it turned out it was—the cytokine was interferon gamma, and it was earlier called macrophage activating factor.

[01:26:41]

And so this is where the medicine part that you're probably not hearing yet much of intersected with this protein interaction part. When I was an intern, my first month, actually, I admitted a patient to Division 40 at University Hospitals in Cleveland with—a 19-year-old fellow with acute myelogenous leukemia. He was induced with the usual therapy at the time, and developed profound neutropenia, which is a drop in their Y count to zero. And so I managed him for the first few days of his admission, until he became septic. And, of course, once you have sepsis you then get transferred to the unit which is around the hall, the corner of the hall. My next rotation was in the ICU, where he was my patient there, and so I cared for him for the entire month until



Interview Date: January 23, 2019

his death. And he was the first patient—yeah, I would say he probably was even the first or second—I think he was the first patient that I had as an intern that died. And it was not a—it was an awful death. Sepsis, acute lung injury that he had, he was on a respirator for most of the rest—the last three weeks of his life. And so I—you keep asking—well, I kept asking myself, what can we do for him? What can we—? And I actually—it was a wrenching experience. But the thing that I—became apparent to me is—and this particular hospital wrote, in many ways, the book on febrile neutropenia—is that he needed white cells. The guy was—in fact, he even got tran—this is back in the first wave of interest in transfusing white cells, and the guy—Roger Herzig was the hematologist who was taking care of him, and he wrote the first paper back in 1979, I think, on white cell transfusions out of Case Western, New England Journal. And so we gave him white cells; it didn't work. And so that issue of the cells as—and I got into infections. At this point I was just an intern. So I was very interested in—I became interested, because of that experience, in figuring out how to treat infection, the major cause of sepsis, and how to impact that underlying problem that patient had, which is the neutropenia that was chemotherapy-induced. We used to have this Latin phrase, and back then it was more of it because there was little we could interfere with. It's called *iatrogenicus medicus profunda*. (laughter) It's kind of a—there are only a certain number of people I can tell that to. My wife is one], because she and I trained together, it turns. And you would say *iatrogenicus medica* profunda, medicus or [churgia?]. (laughs) It was either—essentially, iatrogenicus is physiciancaused, right? And profunda means seriously bad thing you did to this patient. And, of course, it was medical. You add that additional "medical" on. And here we were, trying to cure this disease, and what we were doing is essentially killing him, because we rendered his defenses essentially ineffective.

[01:30:25]

So I learned relatively early in my medical career that all that we do is not good, and are there ways we can mitigate. And so the infectious piece was—I learned to love infectious diseases, not because—actually, I didn't like microbiology so much. So it's interesting: I liked making diagnosis, and getting patients better. And, of course, that's my attraction to infectious diseases. I learned microbiology, but I was taught how to make it more manageable, because microbiology is quite—it's a lot of memorization of—can be viewed as memorization of a lot of bacteria, viruses, and fungi, and that doesn't necessarily appeal to me. I like to know how things work. I'm process-oriented. And when I was able to take microbiology and reduce it to more processes...And that's why I teach the lecture on sepsis—that's where my strength is. So this guy died of severe sepsis, and I wanted to know how we could prevent that. And also, I was really interested in knowing—and this is almost not even conscious, is how can we prevent the neutropenia? We can't give them—it seems the white cell transfusions weren't going to work, but how could we prevent the neutropenia or reverse it? How can we kick—jumpstart the marrow in the patient like this?



Interview Date: January 23, 2019

[01:31:47]

So when I—I kind of sidestepped into immunology. Immunology—one thing about infectious diseases is, one, I think infectious disease physicians fall into two categories, two camps: one is those that are really interested in the bacteria/virus/fungal element, or fungi; and the other is interested in how the host are reacting to that invasion. And I clearly fell down on the right side. I was really very interested in seeing if I could understand this and mitigate it in a better—and so the patients would not die. And so I, in my infectious disease fellowship, I trained with Jerry Ellner. Jerry was very interested in how the host responded to the infection with tuberculosis, and he was interested in the cell that was probably the ultimate effector cell in tuberculosis, which are called macrophages. And therefore we're kind of circling back to macrophageactivating factor. Turns out that T-cells make a protein called interferon gamma, or macrophageactivating factor, that takes—tells the macrophage to activate and kill the TB organism [in its phagocytosis?], get rid of it. And so Jerry was really interested in how those cells didn't get the signal, and didn't do their job. And so I started working in his lab, and there are a lot of aspects of that process, but one of them that... It's kind of an intricate ... If you talk to immunologists, I—when I was an undergraduate in Princeton I thought the smartest people at Princeton were the mathematicians and then the physicists and then the chemists, (laughs) and then the biologists were after that. In medicine, I think the really smartest people are the immunologists, and then the hematologists, and then the infectious disease people. I think that's the order, because immunology is so intricate.

[01:33:47]

And the story here, it's—you almost always—whenever anybody tells you an immunology story, they're always giving you the simple version, (laughs) because they can't give you the full version. It'll take too long. But the very simple story around macrophage is in order for the the macrophage-activating factor is made by T-cells -- and the T-cells need to know when to make it, because if they made it all the time you'd get what is called HLA, which is this hemophagocytosis syndrome that we just had a case in *Morning Report* last week about, where it's called macrophage activation syndrome. These patients have this syndrome related to the uncontrolled activation of macrophages. So you want to be careful about when the macrophage gets its signal. Well, the way it gets it in the setting of TB is the organism is phagocytosed by the macrophage, and the macrophage does a little bit of digestion of it, and sort of chops it up into pieces, and puts some of those pieces onto what's called the major histocompatibility locus, HLA-DR. And the T-cell comes along, and if it happens to recognize, having gone through all this evolution to recognize that antigen, it gets the signal to activate, and it expands its number, and it produces the macrophage-activating factor in that local environment, activates the macrophage. The macrophage then becomes more effective at killing the [bacteria?], and you control the infection. So we were—Jerry had shown that individuals who don't have that—don't show that ability, have the TB but they don't do this process, have ... He was interested in knowing why, and he asked me to do this project where I would take—they had just described HLA-DR. It turns out Benacerraf up at Harvard had just gotten the Nobel Prize for



Interview Date: January 23, 2019

transplantation antigens, and transplant immunology, and although the context I'm explaining it in is microbiology or immunity to organisms, it turns out these antigens are very important for transplantation, because if you have mismatches across this antigen, the T-cells then kill the organ that has the mismatch.

[01:36:15]

But Jerry realized, as many people early on, that that same antigen that's recognized as foreign when you transplant it does this presentation to the T-cells in the context of this infection. So he had the theory: he said, "Why don't you explore the hypothesis that that antigen is not expressed on the monocytes of patients who have TB and are energic?" It's this concept of—we're very familiar now with tumor energy here, right? Because we're now reversing tumor energy, and Jim Allison got the Nobel Prize because of the understanding that he had in how energy develops, but at that time we didn't know what Jim knew. And there was a good reason to think that maybe those antigens were not on the surface of the macrophage. And, indeed, what I was able to show was -- I was able to get monocytes from patients, or get blood from patients, isolate the macrophage precursors called monocytes, and show that those cells didn't have as much HLA-DR on their surface. It was reduced about 50%. And then, this is, again, just ... And then when you incubated them—and I developed a way we could incubate them and still study them the next day—they grew. The macrophages had a burst of this—expression of this energy. It turns out that—we thought there was something being produced, and it might've been macrophage-activating factor. So we basically wrote a letter to Genentech and said, "Can you please give us some (inaudible) interferon gamma? And we'll see whether it is—interferon gamma has the ability to cause a sprouting, if you will, of this antigen." And we got it, and it did. And then the other thing it did, it did everything: it activated any test that we ran in that laboratory, that I ran and my colleagues ran. It just—you got a positive result.

[01:38:11]

So the lesson in science that I learned when I—now what I train everybody is if you want to get somebody interested in science, and for a real commitment, give them an experiment that works. (laughs) And so this worked. It affected a white cell. I was very interested in white cells. It wasn't the neutrophil; it was a different lineage, but closely related. And the cytokine that did this was cloned.

[01:38:35]

T. A. Rosolowski, PhD

[01:38:37]

Why don't we leave it for today there?

[01:38:40]



Interview Date: January 23, 2019

David Tweardy, MD

[01:38:40]

Okay, yes, yes.

[01:38:41]

T. A. Rosolowski, PhD

[01:38:41]

Yeah, because we're at four o'clock, actually.

[01:38:43]

David Tweardy, MD

[01:38:43]

My God.

[01:38:43]

T. A. Rosolowski, PhD

[01:38:43]

I know. And this is a good cliffhanger moment with the lesson learned. (laughs)

[01:38:47]

David Tweardy, MD

[01:38:47]

Yeah, I'll tell—yes, thank you for your—(laughter) I had a clock right in front of me and I'm not even looking at it.

[01:38:52]

T. A. Rosolowski, PhD

[01:38:52]

No, you're not even looking at it, because you're into your story. (laughs)

[01:38:54]

David Tweardy, MD

[01:38:54]

Well, you're a very good audience. You're a very good audience. And I have to say, it's been—it's fun doing this.

[01:39:02]

T. A. Rosolowski, PhD

[01:39:02]

Good, good. No, it is fun. Yeah.

[01:39:04]



Interview Date: January 23, 2019

David Tweardy, MD

[01:39:04]

Good. I'm glad you're enjoying yourself. (laughs)

[01:39:05]

T. A. Rosolowski, PhD

[01:39:05]

Yeah. Well, I want to thank you for your time today.

[01:39:08]

David Tweardy, MD

[01:39:08]

No, my pleasure.

[01:39:09]

T. A. Rosolowski, PhD

[01:39:09]

And I want to say, for the record, that I am turning off the recorder at about three minutes after 4.00

[01:39:15]



Making Cancer History®

David J. Tweardy, MD

Interview Session Two: March 20, 2019

Chapter 00B Interview Identifier

T. A. Rosolowski, PhD

[00:00:01]

All right, our counter is moving. It is about 13 minutes after 2:00 on the 20th of March, 2019, and I am in the office of Dr. David Tweardy, and this is our second session together.



Interview Date: March 20, 2019

Chapter 06

Cytokines and Cancer-Related Research at the University of Pittsburg (late Eighties)

A: The Researcher;

Codes

A: The Researcher;

A: Overview;

A: Definitions, Explanations, Translations;

D: Understanding Cancer, the History of Science, Cancer Research;

A: Personal Background;

C: Discovery and Success;

A: Inspirations to Practice Science/Medicine;

A: Influences from People and Life Experiences;

D: Technology and R&D;

T. A. Rosolowski, PhD

[00:00:01]+

And we were strategizing a little bit, or reminding ourselves where we were when we left off last time, and you were working with Jerry Ellner during your fellowship at Case Western. And you were talking about how the impact of the results that you had gotten working with macrophage-activating factor, and where that led you next, though I'd also like you, if you will—I mean, your story of that research study at the end of last session was really dramatic and exciting, but were there other takeaways from that period, working with Jerry Ellner? So I want to get kind of the full picture of what you had in your toolbox when you moved on to the next challenge. [00:01:01]

David Tweardy, MD

[00:01:01]

Right. So I think the toolbox I had at that point included a great respect and excitement about cytokines, particularly ones that were recombinant, cloned, and purified. One of the major breakthroughs in cytokinology was the ability to purify and sequence a small amount of the cytokine, and then from the sequence of the amino acids actually obtain the cDNA sequence, what's called the cDNA clone of that cytokine; and then take that gene, essentially, and put it into bacteria, and the bacteria would just make gobs of it. And so experiments might take years to do, because you had to keep purifying these dilute cytokines, or cytokines present in dilute solution, before you could do the next experiment. Now, you just—you went to the cytokine store (laughter), Genentech, in this case—and bought—they gave you the cytokine, or you



Interview Date: March 20, 2019

bought it, and you could just do endless numbers of experiments. So it was a major breakthrough in molecular biology, and I was actually wanting to participate in that molecular biologic breakthrough. And it turns out macrophage-activating factor or interferon gamma, also, as it's known, was cloned in this way I mentioned early on in the game of cytokines. This is one of the second or third cytokine that was molecularly cloned in this fashion. So I said, I want to clone a cytokine so I could then do these fantastic experiments, and discover new things about the cytokines that were heretofore unable to be really discovered.

[00:03:01]

So that was—I ended—actually, this is where my wife now factors in, because she was interested in continuing her medical training. She matched to the University of Pennsylvania Cardiology Program. So I wanted to be together with her, and so we then searched for—well, I had to, really, in this case, search for a position in Philadelphia. [00:03:23]

T. A. Rosolowski, PhD

[00:03:23]

Let me just ask you, because I don't know if I did the last time: your wife's name? [00:03:28]

David Tweardy, MD

[00:03:28] Ruth Falik, F-A-L-I-K. [00:03:31]

T. A. Rosolowski, PhD

[00:03:33] Okay, and when did you guys get married? [00:03:35]

David Tweardy, MD

[00:03:35] We got married in 1982, January the 21st. [00:03:41]

T. A. Rosolowski, PhD

[00:03:43] Why are you smiling? (laughter) [00:03:44]



Interview Date: March 20, 2019

David Tweardy, MD

[00:03:44]

Because I always think it's in '81, but I always have to realize there's a two, not a one, at the end of that. And I—

[00:03:52]

T. A. Rosolowski, PhD

[00:03:52]

You've gotten corrected about that at the dinner table? (laughs) [00:03:54]

David Tweardy, MD

[00:03:54]

Yes. Well, not much lately. It's deeply embedded, and I have it engraved on my ring. That's why I always fidget with my—should I look? No, I think I can remember. Anyway. [00:04:04]

T. A. Rosolowski, PhD

[00:04:04]

It's like forgetting your kids' names and their birthdays, yeah, yeah, yeah. [00:04:08]

David Tweardy, MD

[00:04:07]

Yeah, that's different. I get forgiven much more easily for that. The names, no. Birthdates for them, yes. Our anniversary, never. I—
[00:04:15]

T. A. Rosolowski, PhD

[00:04:15]

Isn't it funny how the brain retains certain details easily and not others? Yes. (laughs) [00:04:19]

David Tweardy, MD

[00:04:19]

Yes, perhaps out of requirement, insistence or whatever. But, yeah, in fact, we—[00:04:26]

T. A. Rosolowski, PhD

[00:04:25]

Okay, so you guys are in Philly.



Interview Date: March 20, 2019

[00:04:27]

David Tweardy, MD

[00:04:27]

We're—well, we were in Cleveland, because we were an intern romance that ended up favorably, (laughter) positively, and—
[00:04:37]

T. A. Rosolowski, PhD

[00:04:37]

I've never heard that phrase before, "an intern romance." [00:04:38]

David Tweardy, MD

[00:04:38]

Yeah. Oh, these are high—these have high failure rates. Intern romances generally don't work out, but it was really a very cool story. But at this point, because we were interns together, I stayed on to do my infectious disease fellowship, and actually she had already gone to Philadelphia, and so we were apart for a year. And so when I got able to—I was free, so to speak, to get a new position—I looked for a position in Philadelphia, and with the specific, I mean, laser focus on I want to clone my own cytokine. I want to go to a lab where I can learn how to do this. And I was very fortunate to find the laboratory of Giovanni Rovera in the Wistar Institute. And I interviewed, actually, in the end—and, interestingly enough, the Wistar Institute was far and away at the leading edge of molecular biology, this ability to clone cytokines, anywhere in Philadelphia, in Giovanni Rovera's lab, and Carlo Croce's lab, who is a member of our Scientific Advisory Board, actually. [00:05:49]

T. A. Rosolowski, PhD

[00:05:49]

I thought I recognized the name, yeah. [00:05:51]

David Tweardy, MD

[00:05:51]

Yeah. These labs really were developing the technology in their labs, and so I chose, actually, Johnny's lab, even though there was another lab in the Wistar Institute that I could've joined, but I think it just was very fortunate I joined Johnny's lab, because Johnny wanted to clone a cytokine that impacted white blood cell growth. And so that was completely simpatico with my desire, because I had already been working with white cells and I wanted to do a cytokine, clone a cytokine, so it was a perfect arrangement. And so, at first, as I mentioned to you, the first thing



Interview Date: March 20, 2019

you have to do to clone a cytokine is you have to purify it to essentially homogeneity, which means the only thing in that tube of liquid is your protein. Then you put that on a sequencer to get the amino acid sequence, and then you convert that amino acid sequence to a genetic code. Those nucleic acids --there are three per amino acid that code for that amino acid, and then you make a chain of nucleic acids around 21 to 24 nucleic acids long. You make it really hot, and then you use that to probe a cDNA library, which is a library that has all the genes—or all the RNAs, I'm sorry—copied into DNA from a cell. Now, probably this is—I'm going to do this anyway, even though I'm (overlapping dialogue; inaudible)—
[00:07:31]

T. A. Rosolowski, PhD

[00:07:29]

I know you—I never—microbiology people and molecular biology people always do this. I sit very patiently and hang on to what I can. (laughter) So go for it. [00:07:40]

David Tweardy, MD

[00:07:39]

Okay. So the cell that I used—and I was successful to getting to near homogeneity, but not quite, because then I was—we were scooped. Our laboratory was scooped on the process of cloning this white blood cell growth factor called G-CSF by two companies. One was Amgen in California, and the other was Chugai in China—I'm sorry, in Japan. And so I didn't go that purification route in sequencing. I looked to see what they had, the actual sequence of the gene, and I made a small fragment of that to then pull it out of—the right clone out of a library. And I won't go into the details of that library, but that library essentially is a bacterial library that has all of the RNAs that a cell—in this case the cell we were starting to purify—all the RNAs that that cell makes. And so included in that million-colony library were several copies of the RNA that made the cytokine that I was interested in. And because—it's kind of like fishing, but it's fishing in a medium-sized tank, and what you use as bait is you use this very hot probe that you know is homologous. In fact, it's the same sequence as the fish you're trying to pull out. And because of --just the nature of DNA is if you have a copy that is floating, and it sits, it can find the gene you're interested. And if it's hot enough that colony of bacteria that's making that gene will light up, and it will show, and you can pick that, and now you have the gene. [00:09:34]

T. A. Rosolowski, PhD [00:09:34] Wow.

wow. [00:09:34]



Interview Date: March 20, 2019

David Tweardy, MD

[00:09:35]

It's a very—yeah. Oh, I mean, I still have vivid memories of when I was sitting on the other side of the developer, and what you're looking for, you have a plate. You made multiple filters, each having maybe a thousand bacteria on them, and you maybe did a hundred plates, so you have 100,000 colonies, and you collected—you put them all out, and you put the film on, and you put the film into the developer, and you're waiting on the other side of the developer for a plate that has—or a circle, which represents the plate that has a black dot on it. And I still vividly remember seeing black dots on some of those films, and I got very excited because, indeed, I'd been able to clone the cDNA for G-CSF. Now, as I say, I was the third to do it, but we were able to then do some very nice experiments with that gene. We were able to find out where that gene mapped on the human chromosome, all the human chromosomes, and then we were able ... And, actually, while we never were able to do massive numbers of experiments that the ability to have the clone would allow you to do, because by then Amgen was selling it—they beat us—I at least learned a very important technique of molecular biology, and then moved me into other techniques, such as gene mapping. In particular now, because of the important—in fact, we, by virtue of having that cytokine available, we were able to really demonstrate that it is, of all the hormones that affect hematopoietic growth and development, G-CSF was the most important for producing in the body white blood cells called—have many names, but it's polymorphonuclear leukocytes, or PMNs, and these are the major infection-fighting cells.

[00:11:40]

So that got me moved away from macrophages, which --monocyte macrophages-- which I think was the cell that I told you about when I was working with Jerry, to the neutrophil, or PMN. Then I moved from Wistar to Pittsburgh with my first grant, and I started really working on then how does that cytokine --now that it was cloned and available-- how does it, when it binds to a cell that has a potential to become a neutrophil, how does it signal the cell to become a neutrophil now? I became very wrapped up into that, and that's how I got into the STAT3 field, because STAT3 was a critical signal that was activated inside the cell when G-CSF bound to the surface of the cell.

[00:12:27]

T. A. Rosolowski, PhD

[00:12:27]

So let me just say, to connect some date dots there, that you were at the Wistar Institute July '84 to December '86, and then began at the University of Pittsburgh—
[00:12:39]

David Tweardy, MD

[00:12:39]

Right, my first ac—



Interview Date: March 20, 2019

[00:12:41]

T. A. Rosolowski, PhD

[00:12:41] —in '87. [00:12:41]

David Tweardy, MD

[00:12:41]

Yeah, that was my first academic appointment, right.

[00:12:44]

T. A. Rosolowski, PhD

[00:12:42]

First academic position, yeah, okay. So you established your own lab, had grant funding for that.

[00:12:50]

David Tweardy, MD

[00:12:49]

And I established my own lab there. I had two grants. I was—

[00:12:51]

T. A. Rosolowski, PhD

[00:12:51] Wow, okay. [00:12:51]

David Tweardy, MD

[00:12:51]

—ready to go. The Wistar Institute was a fantastic place for me. It was pretty concentrated, two and a half or so years, but I was able to achieve that incredibly critical—make that overcome that incredibly important barrier of funding. I mean, if you want to be a scientist, that's good and great, but show me the money. Give me—

[00:13:15]

T. A. Rosolowski, PhD

[00:13:14]

Now, why did you select the—I'm sorry, yeah—University of Pittsburgh?

[00:13:18]



Interview Date: March 20, 2019

David Tweardy, MD

[00:13:16]

Yeah, well, again—that's a good question—it was, again, related to my wife. She had finished her fellowship; I had finished my work with Giovani Rovera, and we were both looking for jobs, and we both found positions at Pittsburgh. She found a position with the University of Pittsburgh at the VA there, the Oakland VA, which was part of the University of Pittsburgh's teaching and clinical venue, and I found a job at the newly formed Pittsburgh Cancer Institute, yeah, which was very interested in the kind of work that I was interested in doing; that is, understanding growth factors and the signaling events that impact on white blood cell function. [00:14:02]

T. A. Rosolowski, PhD

[00:14:02]

Well, that's interesting from two perspectives. I mean, first of all, a great opportunity personally to have two career couples. (laughs) Yikes.

[00:14:11]

David Tweardy, MD

[00:14:10]

Yes, always a difficult—and I'm very sympathetic for everybody who is in that situation now.

[00:14:14]

T. A. Rosolowski, PhD

[00:14:13]

Yeah, it's very tough. And then good home for your research, but then also being part of a new institution—

[00:14:23]

David Tweardy, MD

[00:14:23] Yeah, yeah. [00:14:24]

T. A. Rosolowski, PhD

[00:14:24]

—developing—offers often some really—opportunities.

[00:14:27]



Interview Date: March 20, 2019

David Tweardy, MD

[00:14:27]

It did, and it kind of—my research clearly tended towards cancer, particularly leukemia, because the hypothesis that supported my first grants in—not the very first grants but my second wave of grants, while I was in Pittsburgh—were centered on the notion that a molecule like G-CSF, that drives a cell to differentiate to a terminally-differentiated cell that no longer proliferates, that leukemia, which is a disease which is marked by impaired differentiation and continued proliferation, maybe G-CSF signaling was screwed up in those cells. So that pathway of driving differentiation to terminal differentiation could be altered in leukemia, and may explain why leukemia cells are abnormal. So that drove the first five or so years of my research there. [00:15:27]

T. A. Rosolowski, PhD

[00:15:27]

And what were some of the outcomes for that?

[00:15:29]

David Tweardy, MD

[00:15:30]

Well, the major one that really is long-lasting was that G-CSF stimulates, or activates, a second messenger inside the cell that tells the cell—I initially thought it told the cell to differentiate, and that signal was called STAT3. And I was very excited. It turns out that—there were some biochemical and molecular biologic experiments that kind of under—and really drove me to get my first R1—that said, hey, if you don't have a full-length G-CSF receptor, and you don't fully activate STAT3, the cells can't differentiate. And actually, we even—and there was actually a naturally-occurring, truncated form in the G-CSF receptor that doesn't have the ability to activate two STAT3s. And so in that isoform, if you will, a G-CSF receptor was up-regulating leukemic cells, so we had the beginning of a pretty cool story. In the end, it turns out that story was only partially true, in that STAT3 was essential for the differentiation of the cells, but it didn't drive its differentiation. What it did was maintained the cells viable so that other factors could mold its actual phenotype down towards a neutrophil. And actually, right at the time we discovered that, we discovered a nice little, very important story that complemented that finding in myeloid, or hematopoetic cells. And this was in a type of cell that causes—well, that is, in fact, head and neck squamous cell carcinoma. And in that tumor system, we definitely showed that STAT3 was critically important to keep those cells growing as well. So we abandoned the notion that STAT3 drove differentiation of myeloid cells, and went whole hog with the concept that STAT3 drives proliferation, and maintains survivorship, or survival of cells, and then flipped our thinking that we shouldn't try to augment STAT3 to drive differentiation, but rather we should start targeting STAT3 to inhibit growth and to get cells to die. And that was a very—that was pivotal. And we did that—we came around that in ninet— [00:18:19]



Interview Date: March 20, 2019

T. A. Rosolowski, PhD

[00:18:17]

Yeah. Talk about paradigm shift. (laughs)

[00:18:19]

David Tweardy, MD

[00:18:19]

It was, and it was because—this is really where it's—I'm a very collaborative person, and in part just by nature, perhaps. Maybe—we talked about my large family, and how I like working with people, just because I think it reminds me of that good time I always had with my family, and my brothers and sisters. But I also realize that you never know where science is going to lead, so I actually brought—had somebody—actually, a very successful ENT surgeon enter my lab very early on—I think it was the first year I was at the Pittsburgh Cancer Institute saying she wanted to work on cancer of the head and neck. And so we went to the textbook— I've forgotten the name of it, classic textbook on oncology—and every chapter of a cancer system—breast cancer, lung cancer, prostate cancer. You start with the epidemiology, or the clinical disease, and then the next is pathogenesis, like how does the tumor develop, what's our understanding at this point in time. Well, if you did that for head and neck cancer, that section was missing. Nobody really knew how head and neck cancer developed. There were very —I mean, we knew at that time that alcohol and tobacco use predisposed, but we didn't know why, and what that did to the cells, normal cells lining the upper airway, how that made that one cell or two cells, whatever, become malignant. And so I had been working, still in the AML field this is mid-1990s—thinking of the fact that growth factors, like G-CSF or GM-CSF, could actually be produced by the cancer cells to drive their own cancers, their own proliferation. And so I said to Jennifer Grandis—actually, her name was Rubin then—I said, "You know what? Look into how do squamous cells of the upper airway, how do they grow? What drives them to grow?" And so that began just a remarkable series of experiments, where we found out that TGF alpha and EGF are the major growth factors, in fact -- I didn't find this out; this was known already, and she dug it up out of the literature—are the major growth factors for cells of this origin. And so then she was able, with the help of a very great collaborator, Theresa Whiteside at Pittsburgh, to explore 16 to 20 human squamous cell carcinoma cell lines. And the first thing I think she demonstrated was that those cells produced TGF alpha, and they produced a lot of it. So the first part of this, autocrine loop, having a cell make a growth factor that allows it to grow, checked that box, right? So the next thing is, okay, does it have the receptor? And is it their normal amounts or lower amounts? Turns out blazing; they all made lots of it.

[00:21:39]

And this is where, actually, we were really—I brought to Pittsburgh something that many of the surgeons, even, and others liked about me, which is I had modern, up-to-date molecular biologic expertise. So there weren't actually abilities to measure these things like protein level; the only



Interview Date: March 20, 2019

way you can measure them is at the RNA level, and I was a master of the technique of measuring RNA, which is called northern blotting. It's an interesting story, why it's called northern, but anyway. So we were able to really answer that question very rigorously. Then she and I started publishing on squamous cell carcinoma drives its own proliferation through this autocrine cycle. And the reason that was important is that we both—when STAT3 was identified by Jim Darnell in 1991, '92, both EGFR, the receptor that was massively upregulated, activated STAT3. And so the next question we asked was, well, is STAT 3 there? And yes it is. And that's when we knew—and when we targeted STAT3, it inhibited the growth, that we knew that, along with the data I told you about myeloid cells, we knew that STAT3 was a growth promoter. And so by virtue of having that project running in parallel to my core program, we're able to connect dots and make that, as you say, paradigm switch, like (snaps) that. We said, a-ha! And we were actually the first to describe STAT3 as an oncoprotein in a human malignancy. That was the first description of it, first evidence of it.

[00:23:21]

And then, like I said—and then the other very fortuitous thing that occurred in 1998 was a group in Europe had crystallized STAT3 bound to DNA. So this was the very beginning of the era of structure-based drug design, where people would take the crystal structure, figure out the critical part of it that was important for its function—like in kinases, the actual kinase domain, and how all kinases bind ATP, and ATP is then—that phosphate, the last phosphate on ATP is transferred to the target of the kinase. And so all of them have pretty much a similar structure, slightly different, but the way all the kinase inhibitors, like Gleevec and John Mendelsohn's [oral history interview] targets in kinase that he developed, Imatinib, the way they were developed was having the crystal structure of the kinase, and knowing, at a molecular level—atomic level, actually—that little pocket that the ATP bound into. And the idea is if you could put a molecule that's not ATP into that pocket, you could inhibit the enzyme.

[00:24:36]

T. A. Rosolowski, PhD

[00:24:35] You block it, yep. [00:24:36]

David Tweardy, MD

[00:24:36]

Yeah. And so that was the beginning of that era of what's called structure-based drug design. So once—

[00:24:43]



Interview Date: March 20, 2019

T. A. Rosolowski, PhD

[00:24:43] I'm sorry, structured-based? [00:24:44]

David Tweardy, MD

[00:24:44] Structure-based drug design. [00:24:47]

T. A. Rosolowski, PhD

[00:24:47] Oh, okay, yeah. [00:24:48]

David Tweardy, MD

[00:24:48] Yeah. And so we— [00:24:52]

T. A. Rosolowski, PhD

[00:24:52]

Where it helps to think like an electron. (laughs) [00:24:54]

David Tweardy, MD

[00:24:54]

Yes, as I told you. That's right. I've always had the ability (inaudible). [00:24:59]

T. A. Rosolowski, PhD

[00:24:58]

Yes. No, no, I see it, I see it. How else is it going to get glued into that little pocket, right? [00:25:03]

David Tweardy, MD

[00:25:03]

Exactly, and so it's the lock-and-key mechanism. If you can develop the key that goes into that lock, it blocks the other real key from going. And so I was very keen, and I said, wow, gee, now we have the structure, can we block the ability of STAT3 to, in this case, dimerize? Because one of the important things about STAT3, it has to partner with another member of its—partner with



Interview Date: March 20, 2019

another molecule of itself to be functional. And there is a lock-and-key in that interaction. To lock that confirmation, it turns out there's a phosphorylated tyrosine in one member that floats over and binds to the pocket, the phosphopeptide binding pocket in the other, and vice versa. It's really cool. It's actually like this reciprocal, tethered molecule. And so it gave us some insight into that. And it turns out that same region of the STAT3 that binds to its partner, phosphopeptide, actually before it even gets able to do that it actually gets recruited to an eGFR and a G-CSF receptor through a phosphopeptide in the receptor. And so it's sitting around, floating around. The cytokine hits the cell. It could be TGF alpha. It could be G-CSF. There's a series of phosphorylation events that occur. In the case of eGFR, the kinase is actually within the structure of the receptor. In the case of G-CSF, it actually kind of associates with the receptor, so it's nearby. And that activates through—actually, the receptors kind of come together, and then they phosphorylate each other, as it turns out, and activate each other, and then start phosphorylating specific residues, tyrosine residues in the receptor. And it's like all of a sudden these receptors develop Velcro, and they're sticky, and they're sticky for molecules like STAT3 that have a little hook. You know how Velcro works. They have the ability to bind to that fuzzy receptor, and then STAT3 gets phosphorylated by the same kinase that phosphorylated the receptor itself, falls away, and then does this homodimerization routine, binds to DNA.

[00:27:29]

So there are two interactions that I was very interested—well, one interaction that actually mediated two steps in the activation, that I became interested in targeting. Once I then ... Because of the work Jenny had done and we had done—and Jenny had done in squamous cell carcinoma, I had done in myeloma and myeloid leukemia—I said, I want to see if we can't target STAT3, and understand how it works. Because this is still the beginning of the STAT3 field. It was started in '91, '92. And so the long and short of it is then, with the structure, we had a way to go forward, and we, in other words, developed small, fake keys that would block those two interactions, and then block STAT3 activation.

[00:28:19]

T. A. Rosolowski, PhD

[00:28:19]

Let me just—because I'm looking at dates here. So you came to Pittsburgh in '87, and you said kind of this—by the time '91 came around there was this critical mass of stories accumulating, understanding. So that's a good five years of work, but that's a huge amount of work, that you're kind of shining the light in this area, and— [00:28:43]

David Tweardy, MD

[00:28:42] Yeah, and that's—and we were not the only ones— [00:28:45]



Interview Date: March 20, 2019

T. A. Rosolowski, PhD

[00:28:45]

And I'm not saying it's a long time. I'm just trying to get us a time map of how it's progressing. [00:28:51]

David Tweardy, MD

[00:28:51]

Yeah, so it's a very important question, is when do these things kind of come together. Well, we actually identified—so when I went to Pittsburgh, we knew that G-CSF bound to the receptor. We developed very early on in my stay at—my start at Pittsburgh-- antibodies to the receptor, so we could ask the next question: well, what does the receptor recruit for the next step of signaling? And that's where we pulled down a couple molecules that—tyrosine kinases that we didn't pursue. But this interesting third molecule -- and that molecule, that we didn't know what it was, because it hadn't been identified yet-- and that third molecule turned out to be G-CSF. When we first published what it was, we called it STATG, because it had all of the functional behavior of, at that time, the early members of the STAT family, STAT1, 2, and 3. We thought it was most consistent with STAT3, but the only reagent that you could use to confirm did not react with it. It was a monoclonal antibody against STAT3, and it didn't react. So when we published the paper, saying that G-CSF binds to T-CSF receptor, and activates a STAT-like molecule, we called it STATG. It turns out, in ret—now, very quickly we learned it was a what was called an isoform of STAT3, called STAT3 beta, and making us the first to identify STAT3 beta in humans. It only had just—in fact, again, papers that you read and get excited about. There was a paper that came out of Hopkins that talked about this truncated form of STAT, called STAT3 beta, in mice. And it turns out that isoform was missing the target of the only antibody that bound to STAT3. It was spliced away when—so, totally explained our data, so we quickly confirmed that, and so— [00:31:00]

T. A. Rosolowski, PhD

[00:31:00]

And so that was around what time?

[00:31:03]

David Tweardy, MD

[00:31:03]

Ninety—so '87, so we're talking probably that was '90, '91, when we published that paper on STATG. Took us a while just to get set up and publish the STATG paper. And wrote a few papers around regulation of G-CSF, as well as the other major hematopoietin called GM-CSF, writing hundreds of northern blots, because that's what I could do when I started. So we published a bunch of papers around regulation of G-CSF and GM-CSF. And then the real focus



Interview Date: March 20, 2019

of what was to be the focus of the lab, we started getting traction. So we published those papers around STATG and then STAT3 beta in '91, '92, '93. Actually, I would say, no, '93, '94, '95, because Jim Darnell had just published the finding of STAT3 in '91, '92, so it was within a year of that. We actually even—so, bottom line, that's the timeline. And so mid-'90s, where we know that G-CSF activates STAT3, we test the hypothesis that I've mentioned that G-CSF drives differentiation through STAT3. We disproved that hypothesis in '97, and then published the paper around STAT3 being essential for squamous cell carcinoma, head and neck growth in '98. The crystal structure comes out in '98, and we go full force into developing small molecules that can allow us to interrogate how STAT3's really working, because ... And so the project—and then I get a grant around that, and in '99 I move to Baylor. So that's sort of the history of that. [00:32:56]



Interview Date: March 20, 2019

Chapter 07

Research and Administration at Baylor College of Medicine A: The Researcher;

Codes

C: Leadership; D: On Leadership;

C: Mentoring; D: On Mentoring;

A: The Researcher;

A: Overview:

A: Definitions, Explanations, Translations;

D: Understanding Cancer, the History of Science, Cancer Research;

A: Personal Background;

T. A. Rosolowski, PhD

[00:32:57]

So why the move to Baylor?

[00:32:58]

David Tweardy, MD

[00:32:58]

Ah, so—

[00:33:00]

T. A. Rosolowski, PhD

[00:33:00]

I mean, unless—did you have other things you wanted to say about—?

[00:33:02]

David Tweardy, MD

[00:33:02]

No, no, that's a nice summary of how I got to Baylor, and what was happening right before I moved. Well, it turns out I'm a person who, even though I seem to think I'm focused, there are certain things I couldn't jettison, one of which is clinical medicine. So I maintained my expertise in infectious diseases, and I was effective as a physician, as well as an administrator, and I kind of liked administration, as well as researching clinical care. And so (laughter) I couldn't make a decision. And so I moved up to the interim Chief of Infectious Disease at Pittsburgh towards the end of my tenure there.

[00:33:46]



Interview Date: March 20, 2019

T. A. Rosolowski, PhD

[00:33:46]

I have '97 to '99 there.

[00:33:48]

David Tweardy, MD

[00:33:48]

Yeah, exactly. And part of it was I was able to do that without really—and maintain laboratory work—I still worked in the lab.

[00:33:56]

T. A. Rosolowski, PhD

[00:33:56]

What was it that you liked about administration?

[00:33:58]

David Tweardy, MD

[00:33:58]

I just liked—I liked allowing people the opportunity to have the early career I did. I mean, I liked—the thing that most excited me about administration was it gave me the opportunity to mentor physician-scientists, and also to mentor even midcareer faculty on the clinical side. Because I think once—(laughs) it's sort of the curse of the chief medical resident. Once you're a chief medical resident, it seems, you never can get away from clinical medicine, because what it told you back when you just said yes to being a chief medical resident is that you really like to oversee care of patients. It doesn't matter if it's you doing it or other younger, next generation. You just like to make certain that that works and the patient gets what they need out of that interaction. So I think that's probably—it was my chief—I've now clearly labeled my chief medical residency as the job that I took that made the difference about my career in terms of—it sort of tagged me as an administrator, to some degree, for the rest of my life. (laughs) [00:35:06]

T. A. Rosolowski, PhD

[00:35:06]

And was there anything about serving in that administrative role in a new cancer center? How did that affect the experience?

[00:35:16]

David Tweardy, MD

[00:35:15]

Well, actually, it's interesting: I was a bit schizophrenic, because it wasn't within—the Pittsburgh Cancer Institute is not like MD Anderson. In fact, at the time I went there, the great



Interview Date: March 20, 2019

fame of the University of Pittsburgh Medical Center ... The most famous individual in Pittsburgh, arguably—yeah, I would say maybe besides Mario Lemieux, who played hockey and won a Stanley Cup for the Pittsburgh Penguins-- was Tom Starzl. And Tom Starzl headed the liver transplant group, and up until 1992 the University of Pittsburgh Medical Center transplanted more livers than the rest of the world combined. It was the mecca of the liver transplant. So the Pittsburgh Cancer Institute was growing in influence, but at that time the major player, if you will, the 96-pound gorilla, clinically, in campus was the liver transplant program. So the reason I say all that is that it's not like MD Anderson; UPMC was not uniformly and monolithically interested in cancer care. It was interested in growing cancer care, but it had very well-established cardiovascular and lung and liver transplants, as well as just general other great head and neck program. Jeff Myers did his residency there. That's where I got to know Jeff. It had a phenomenal ENT surgery program, it turns out. And so as I was an infectious disease physician, I saw cancer patients, but my chief of infectious disease was across all of the disciplines that needed infectious disease care, not just cancer patients but transplant patients and other patients with heart disease who develop pneumonia, etc. So I took on that Chief of ID role at interim. And, again, as I say, because I did find administrative roles fulfilling. And so the answer, getting back to why did you go to Baylor, I was offered the permanent job at Baylor, and it was an ideal opportunity because the technology that was available at Baylor was mouse knockout technology, okay. So I thought I really wanted to see how STAT3 functioned, and my genetic probes were not well-developed enough, but I wanted to come to a place where I could knock out STAT3 and answer the question using mouse knockouts. And Baylor was at that time the premier institution in the country to do knockout technology. And also do my clinical work in infectious disease, as well as administer the department—or the section, I should say—of infectious diseases. It was one of those fortuitous opportunities that it had a huge impact on my life. Coming to Houston was the best thing I ever did, in terms of city-to-city transfer. Yeah. [00:38:20]

T. A. Rosolowski, PhD

[00:38:20]

Well, tell me about that. What happened once you got here? [00:38:23]

David Tweardy, MD

[00:38:23]

So once I got there I was able to establish my lab, and continue the progress on genetically modifying STAT3, but, more importantly, developing these small-molecule probes that I became committed to, even with my last year or two at Pittsburgh. And probably the most impactful—and then, basically, continued to train—in fact, it was really at Baylor that this sort of desire to train the next generation of physician-scientists kind of fully bore fruit, because I was able to write a training grant that brought ID fellows interested in the physician-scientist track, gave



Interview Date: March 20, 2019

them funding for a couple of years, mentored them to write K Awards, which is the first career award most people get. I actually believe I was awarded the first K Award during its first cycle it was ever offered, at NIH, and so I became very attached to that way of transition to independence for physician-scientists. So we had a T32 grant, we had the ability to get aspiring physician-scientists K Awards, which we ended up --because of circumstances-- of all the sections of internal medicine at Baylor College of Medicine, we had 11 successful K Award grants over the time I was there, roughly one a year. Basically nobody else had anything close to that kind of record. And that was because of my commitment to that. And so it was a great experience, in terms of mentoring, but mentoring in a way that actually was impactful, because it got people started in their academic careers, with money that they could cover their salary with, which is the hardest part of going in a physician career track, is how do I pay my salary if I'm not seeing patients? So this allowed them to do that.

[00:40:25]

And so the administrative role allowed me to mentor. And also the faculty at Baylor were phenomenal. I just loved them. I mean, we had four different venues where we had—five venues, four to five venues. We had the Thomas Street Clinic, the VA, Ben Taub, and actually—and at one point Houston Methodist then became St. Luke's. So those four venues, where each of them had their own service line chief, if you will, and each one of those was superb at their jobs. So I could administer with a light hand, and continue the research. It was—and, in fact, it was (laughs) perhaps, the reason I came here, because I saw when I came—if I were to come here, and if I was fortunate enough to be offered the job as Head of the Division of Internal Medicine, the situation was similar. There were strong chairs, and they were fully empowered and resourced, and what I had to make certain is that they just didn't get in each other's way.

[00:41:29]

T. A. Rosolowski, PhD

[00:41:29]

So I was going to ask you how you would describe your leadership style, and—[00:41:34]

David Tweardy, MD

[00:41:34]

Yep, it's—you can tell it's pretty much—I won't say laissez-faire, because there are aspects of the way some of the departments were oriented and that needed direction to align with the current vision, the new vision of the institution, both Ron's [Ronald DePinho; oral history interview] vision and now Peter's [Peter Pisters] vision. But it's one of the things about being an administrator: if you do it enough times, you can get it right. Yeah, I was an interim chair, or I was an interim section chief or chair five times, it turns out, and every time—at least, this is my assessment—every time I did it, I did a better job of it. And I think the reason I ended with my



Interview Date: March 20, 2019

style, almost a style statement of how I administrate, is—the thing that's absolutely spectacular about medicine is the quality of the people that get into it. It's just—it's unlike any place or any other business that I know of. And I'm now getting a little bit of the pharmaceutical field, and my brothers have been in engineering and finance and teaching. I mean, teaching may be similar in some respects, but when you get into a service-oriented field, it just recruits or attracts a certain type of person who is not a cat. It's not like herding cats so much. And so one of the things you realize is you just have to—you don't want to over-manage. You want to undermanage, because the quality and the motivation and the intelligence—and often the emotional intelligence, not just intellectual but the emotional intelligence—is there, and you just have to tweak it. You don't have to come in and just wreck it. It's not like the Marines. You don't have to tear down that individual and rebuild them in the mold of a Marine. That's completely inappropriate. So I've always—and it took me a while to learn that, I think, because I think, especially if you're a lab director, it's kind of a—it's a different—it's the end. It's not that you're working with—not working with very smart people, but you're really driven to get this done, and—

[00:43:48]

T. A. Rosolowski, PhD

[00:43:48]

What were some scenarios that you had a-ha moments? I mean, do you have some particular anecdotes or scenes?

[00:43:54]

David Tweardy, MD

[00:43:54]

Well, I would say, in terms of that, the revelations—[00:43:58]

T. A. Rosolowski, PhD

[00:43:57]

Yeah, the learning curve.

[00:43:59]

David Tweardy, MD

[00:43:59]

You know, I would say certainly in terms of ... There were a-ha experiences, meaning when I came to Cardiology, for instance, my last role as the interim Chair—and maybe the very last; I don't know, we'll see, but I'll probably attempt to do something else. I just can't help but think that, since I've done it five times. I'm a serial interim. (laughs) [00:44:23]



Interview Date: March 20, 2019

T. A. Rosolowski, PhD

[00:44:23]

Yeah. Well, some people specialize in it.

[00:44:25]

David Tweardy, MD

[00:44:25]

Yeah, and maybe (laughs) I'm viewed as that. But anyway, I won't make any more comments around that. But I guess the thing, the a-ha moment I had being the interim Chair of Cardiology was I looked—I assessed that department from the perspective of is anything really broken here, or do the individual faculty just need to be enabled to achieve their fullest potential? And the dynamic of that department, prior to my taking over, I knew reasonably well because I met with the Chair of Cardiology every month, and he had a style of leadership that was —he kind of kept the lid on too tight. His level of oversight was a little bit, maybe, misplaced, and he wasn't enabling his faculty as much. And I think in the bottom line is he had a very high standard, and he was a laboratory researcher, and expected himself to publish in the highest-impact journals, and he somehow thought that his faculty should be able to achieve that same level of success. And I looked at that and went, there's no way on Earth that those faculty who are 80% clinical can achieve that kind of success. And so it's just a realization that you have to manage expectations. You can't expect it. So I went in and said, "Hey, you guys are really"—gals; (laughs) there was one woman in the Department of Cardiology at that time. I said, "you need to tell me about what you do, what you like to do, and what you want to do, and I'll make it happen. I'll allow it." Not make it happen, but, "I will provide what resources and facility and time and effort that I can, and resources to allow that to happen." So it was just—we provided a clinical nurse to help with the clinical protocols. We reintroduced one of our faculty, who had been kind of ostracized, Michael Ewer [oral history interview], probably one of the more productive writers in that department, in terms of clinical oncology, into the fold, and he very generously volunteered to kind of help with writing. And we just—and, frankly, then they just it was almost like they were sort of kept in the cave for a few years, and they came out of the cave, and they realized the sun was shining, the grass was growing, the flowers were blooming, and they just took off. This last year, they probably published four times more papers in the last year than they did when I first took over. [00:47:03]

T. A. Rosolowski, PhD

[00:47:04] Wow. [00:47:04]



Interview Date: March 20, 2019

David Tweardy, MD

[00:47:05]

It was just—they just blew the place up. And so it was not a single epiphany; it was just more of an assessment of what this group needed, and it really wasn't a heavy hand. It wasn't really a whole lot of oversight. It was just allowing them to reach their potential by giving them a little bit more resources than they had had, and they just took off. So I—[00:47:30]

T. A. Rosolowski, PhD

[00:47:30]

Sometimes it is trusting people, too. I mean—

[00:47:34]

David Tweardy, MD

[00:47:32]

Oh, yeah, I had no reason not to. I mean-

[00:47:35]

T. A. Rosolowski, PhD

[00:47:35]

Right, and trusting in the sense that I trust you know what you have to do, and thus I trust you have it in you.

[00:47:41]

David Tweardy, MD

[00:47:39]

Yes, that's right. That's right. You are self-directed, and you know your capabilities. Your self-assessment is on target, with maybe one or two exceptions, as always. And they just had a fantastic last two years. And the first year, they were just grateful to have free rein to do what they thought they could do, and they're really looking for—we're getting close to a permanent chair now, and—

[00:48:11]

T. A. Rosolowski, PhD

[00:48:11]

That's cool.

[00:48:11]

David Tweardy, MD

[00:48:12]

Yeah, and I'm just delighted with that experience.



Interview Date: March 20, 2019

[00:48:15]

T. A. Rosolowski, PhD

[00:48:15]

When did you start in that interim role?

[00:48:17]

David Tweardy, MD

[00:48:17]

It was September two thousand and—so, '18, '17. So I'm finishing up my second year now. [00:48:24]

T. A. Rosolowski, PhD

[00:48:24]

Okay, cool. Well, were there more things that you wanted to say about Baylor? Because we've already started talking about MD Anderson, and I want to make sure we didn't give that short shrift.

[00:48:33]

David Tweardy, MD

[00:48:33]

No, I think I will owe a lifetime debt of gratitude to them, because their science was fabulous. I was able to get the scientific collaborations that I needed to move this project, the molecular probe, the small chemical molecular probes forward, and get the funding I needed. I learned to write grants in Pittsburgh, and I further honed that skill at Baylor. You may not have heard this, but for every percent effort that you have at the lab at Baylor that's not clinical, you have to earn—you have to get that money, 100%.

[00:49:12]

T. A. Rosolowski, PhD

[00:49:12]

Hundred percent. Wow, yeah.

[00:49:14]

David Tweardy, MD

[00:49:13]

Yeah, yeah, and that's the way it was at Pittsburgh, so I've been—(laughs) So when I came to MD Anderson, I mean, I left three grants that I was coinvestigator on at Baylor, because I just didn't need them. That took me up to 80% funded, and I just—I came here, I had to be—I ended up coming here, I think, with like 50% outside support, but I didn't even need that, so ... But that's the different culture here. But the timing was perfect, because the things that I had—the



Interview Date: March 20, 2019

small molecule probes that I had developed were getting ready to go into patients, and so—or getting close, and we were able to kind of use the expertise and resources here to kind of further that effort, write grants that we had MD Anderson as our base so that they had additional credibility and weight in study sections. And so it was—I mean, the Baylor experience was really an experience administratively in doing more with less, and really—and actually, the analogy, the overwhelming, overarching analogy I use at Baylor was—it was a tough place; as you probably know, it was increasingly resource-challenged, and how you maintain morale, esprit de corps, and success in that environment is kind of like a bit of an oasis—how do you create an oasis in a desert, or a calm island in this sea of turbulence? And we managed to do that. I had a—developed a—over the course of the early years there, I established principles that were able to tide us through essentially the rest of my career there, which were lean and somewhat turbulent.

[00:51:00]

T. A. Rosolowski, PhD

[00:51:00]

What were some of the strategies you used?

[00:51:02]

David Tweardy, MD

[00:51:02]

I think empowering the individual service line chairs, and because they were on the ground they knew the facts, making certain those people were competent. I mean, that is, they were capable. They had high emotional as well as intellectual intelligence. And part of that is luck. In the case of the VA, the individual I replaced became service line chief there. He was already service line chief. He was the chief of the academic division. I replaced him at the VA as the—not at the VA but at the mothership at Baylor. He, when he returned to being service chief at VA, was very effective. I mean, I had to tweak him a bit, and he was malleable, and that was the good thing. So he helped, for instance, to help recruit junior faculty using VA resources, because the only institution, frankly, in the Baylor system now that has resources, ironically, is the VA, for faculty development. So he was willing to allow that to happen. The first fellow who started with—when I came to Baylor in 1999, one of the two fellows, they were phenomenal. They moved on. They were the basis for my successful T32 because of their academic success. Tom Giordano, who's the wife—or the husband, I should say—of Sharon Giordano here, became the Medical Director at Thomas Street Clinic, and has had enormous success both in clinical care of patients, as well as mentoring faculty. Barbara Trautner, who was the other fellow with Tom, was very successful in her own right, and actually is mentoring faculty in the Department of Surgery. She has a joint appointment in Medicine and Surgery, and she's gone on to great success. But Tom, in particular, along the lines of mentor, or of service line chiefs, Tom, Dan at the VA—Dan Musher—Laila Woc-Colburn, who—and this is—she's a hyphenated name; it's Laila, and the first part of her hyphenated last name is Woc, W-O-C, dash Colburn, C-O-L-B-U-



Interview Date: March 20, 2019

R-N—was one of the most—probably the single most successful recruit outside the institution I ever made. She came from Case Western, where I had actually done my ID fellowship, as you know, and she was like a guided missile: all you had to do was point her in the direction. We brought her in, actually, to open a second service line at the Ben Taub solely dedicated to HIV patients, because they were just—their falloff was atrocious, and they would just come back again with the same or different severe opportunistic infection, so we knew that they were not transitioning to Thomas Street. And so we set up a service just to transition them, to care for them in the inpatient setting and then effectively transition them to Thomas Street to reduce their recurrent admissions to the Ben Taub and just get them into care, which by that time was having tremendous impact, as you know. And she was [fabulous?], and we moved her over, actually, to the faculty group practice, which is really the one moneymaking operation within our Division of Infectious Diseases, and she just networked like a champ, and just became the major referral for ID patients in the private practice group. And so as Laila Woc-Colburn is the third service-aligned boss.

[00:54:42]

And then Bob Atmar at Ben Taub, longstanding Baylor and Ben Taub physician, did a fabulous job. So I really just told him—here's what I did: I said, "You're doing a great job. Keep doing the great job." And pretty much that was pretty much my recipe for success. And I resourced them as best I could, but I also just shared with them the situation. I mean, there were just limited resources. So I think it was a great team. We were just all—I think we were all working together. It's interesting that group historically had factions, because of just the history, and so I came as somewhat of a unifier. I didn't realize that immediately, but I learned that relatively quickly, is that my presence as the Academic Chief of Infectious Diseases really brought together these four venues in a way they'd never been brought together, and it empowered them to do ... I basically resourced them as best I could, and they knew that I wasn't holding back. And so all of this turbulence and sort of leanness was around us. We were able to recruit faculty. Actually, I came in, there were 28 faculty, or 25 faculty when I started, and I left with 28. I'd replaced every member of the faculty except Dan, who, as I say, preceded me, and Bob Atmar. Everybody else basically had been replaced. So being able to just continue with the churn, retirements and people moving on to other maybe in their mind greener pastures, we were able to bring in really strong people. And that's hard to do in a not fully-resourced environment. So I think, again, it was just empowering the people, being transparent, giving them what I could, and then asking them to make good, or make do, and it worked. And so you can imagine when I came to MD Anderson in 2014 it was like, holy mackerel, you've got to be kidding me. This is—

[00:56:46]

And my first reaction, if you want to know, is you guys should be, like, kissing the ground you walk on here. I mean, this is unreal. It's just unreal. And to hear people complain here, talk about triggers. I had to kind of bite my tongue. And Steve Hahn knows this. Steve Hahn and



Interview Date: March 20, 2019

I—he came about a month after me. Every time we'd be in a division head meeting and a comment would be made about lack of resources or something, we'd just look at each other and take a deep breath. But, so— [00:57:21]



Interview Date: March 20, 2019

Chapter 08

A New Role as Division Head at MD Anderson B: Building the Institution;

Codes

A: Joining MD Anderson/Coming to Texas;

B: MD Anderson Culture;

C: Leadership; D: On Leadership;

C: Portraits;

T. A. Rosolowski, PhD

[00:57:21]

Interesting. Well, tell me how the opportunity to come to MD Anderson came about.

[00:57:26]

David Tweardy, MD

[00:57:25]

So Bob Gagel, my predecessor, was the first Chairman of the Medical Subspecialties Department, in what was then just Medicine, Division of Medicine. And that was essentially the nucleus for the Division of Internal Medicine. So John Mendelsohn [oral history interview], in his great wisdom, said, "We can't manage all of the onco-medicine problems of our cancer patients and get the best results for our patients unless we really grow onco-medicine, the ability of all the subspecialties of medicine to care for the patients prior to their intervention, be it surgical, chemotherapy, or radiation, manage them through all the complications of those therapies, and then get them back on their feet and to the best status that they can be." At that time, actually, the very first onco-medicine, if you will, was Abe Braude, infectious disease specialist, because the very first thing patients got when they got chemotherapy was febrile neutropenia. White count bottomed out, febrile—oh, no, what do we do? Well, and the oncologists, they managed them initially, and actually they did so when I was at Case Western, in Internal Medicine. But it clearly was clear that they couldn't do both really effectively, and so the ID group became experts in management of that, and then all of the other infections that these patients get. So John said, "Let's start this department." And then he said, "You know what? We need to bring in more specialists, because they get pulmonary problems, they get renal problems, they get cardiology problems, and we need to bring in experts that can manage those problems, too."

[00:59:11]

And so the Division started in 2002. Bob, who was the Chairman of the Medical Subspecialties, became the interim, actually, Division Head, and then got the nod for the permanent position



Interview Date: March 20, 2019

very shortly thereafter, and then recruited all the chairs that are there. Psychiatry, by the way, was the latest addition to our division. They joined us in 2015, '16. Yeah, they were out there floating around, and we said, "Come join us." So they did, and it's been a great story ever since. But so that—so Bob grew it, and basically he was there during the linear growth phase, and then—

[00:59:56]

T. A. Rosolowski, PhD

[00:59:56]

And remind me his name again? Bob?

[00:59:58]

David Tweardy, MD

[00:59:58]

Yeah, Bob Gagel, G-A-G-E-L. Robert Gagel. Endocrinologist par excellence, the describer of multi endocrine neoplasia syndrome, MEN.

[01:00:10]

T. A. Rosolowski, PhD

[01:00:10]

Okay. So he was the one who contacted you, or?

[01:00:13]

David Tweardy, MD

[01:00:13]

No, no, no, no.

[01:00:14]

T. A. Rosolowski, PhD

[01:00:14]

Oh, okay, okay, I'm jumping the gun. Sorry.

[01:00:16]

David Tweardy, MD

[01:00:15]

So the way it works—yeah, no, no, no, no, no. Actually, did he ever make any contact with me? I don't think he did. What happened is—in departments of medicine, which this is really essentially ... The more standard approach is you go to the dean, or the dean equivalent, and you say, if you're the Division Chair or Division Head, as Bob was, you say, "I'm thinking of retiring. I want to step down." And so this is a major—it's like any other Division Head, but we're the second or third largest. So what—at that time that was—yeah, Ethan Dmitrovsky [oral



Interview Date: March 20, 2019

history interview] was the Provost, equivalent of the dean essentially. So he did the usual thing: he started the process for a search. And, actually, I was contacted by one of the members of the search committee. At that time I had a close relationship with Issam Raad, because Issam is the Chair of Infectious Disease here. I was the division head equivalent across the street. And we had a joint program, actually, in the ID fellowship program, so I was known to the community over here, particularly the ID community. And I wouldn't be surprised if the ID community here kind of gave Cortes, --actually Jorge Cortes is now—who left the institution just recently, who was on the committee, a heads-up, and said ... And actually, I saw the ad, too. And so I was already getting interested in it, and Jorge said, "Can I answer any questions about it?" I said, "Hmm. Yeah." I asked him a few questions, but then I—so I think at that time I either had already sent a letter of interest or I was about to, so I sent the letter. And so went through the usual interview process. I made it to the finals, and, frankly, I had a vision for the Division, as you might expect, that it was a requirement for the finalists to do. And, fortunately, I was chosen.

[01:02:30]

I mean, the one thing that, again, just surprised me—this is where the cultural differences became apparent. And people gave me a heads-up in advance, my people like Javier Adachi, who is an ID here, and I'd worked with him, because he was the Program Director here, and he and Barbara Trautner, who was my program director over there, kind of had lots—reasonable numbers of conversations with Javier. He said, "You've got to be careful. MD Anderson is not Baylor." And I, during my interview process, realized that. But the thing that—it's kind of like that old Joni Mitchell song: "You don't know what you've got till it's gone." I mean, I came here and realized, guys, gals, you've got an amazing situation here. And while clearly no place is perfect, I was very excited about how we could tweak it. Not a gross overhaul, because this division was well run by Bob, and the chairs, they were well-oriented. They were a little spoiled, if you will, because MD Anderson allowed you basically—so if you lost this person, you could immediately rehire. That concept is not generally out there. You lose a person, you need to reevaluate whether you really needed that person. Well, that was foreign. When I came here you may know this—that was a foreign concept four years ago, four and a half years ago. You lost somebody, (snaps) it was like (snaps) boom, a person reappeared, somebody popped up and replaced them, just like whack-a-mole. (laughter) But it was a foreign concept to me, and I said, well, if that's the way it is, that's great. I mean, I can work with that, because it's the opposite. You wouldn't be able to resource people. I was very used to that at Baylor.

[01:04:24]

So I looked at the position. I immediately realized ahead it was a great place for me to be. It would allow me to move into the role equivalent of a department chair, which I kind of—and this is the other thing: the curse of the chief medical resident. For some reason if you're a chief medical resident you sort of get somewhere embedded in your head that you should be chair of medicine. So, yeah, (laughter) you can talk to other chief medical residents, see if that's true.



Interview Date: March 20, 2019

I've talked to a few, and that tends to be a trend. And so it allowed me to do something I sort of had envisioned as a career. It allowed me to also mentor and facilitate on a higher level, with a group of chairs here, or I had taken a position elsewhere. And I looked at a number of chair positions over the course of the last five years before taking this one. You want to mentor division heads --over at anywhere else here would be chairs. And the thing that I was fortunate, by being interim chair at Baylor, it made me sensitive to how different the different disciplines of medicine treat and think, and their perspectives. It was shocking the first time. I kind of you're just naïve, is what it is. When I became the interim Chair, it actually was the first time I really got exposed to this, when I was asked to chair the search for the new pulmonary head across the street, and I got to know the pulmonary faculty very well. I just thought, boy, these people think differently than ID colleagues that I've been exposed to throughout my career at Case, Pittsburgh, and Baylor. And then when I became interim Chair of Medicine, I got that in spades, is that everybody, all of these different disciplines of medicine, they view the world differently, and you had to be able to up your game in terms of synthesis of information and perceptions, that you didn't have to. I mean, you had to change your vocabulary a bit. You had to recalibrate what was important, and why it was important, and how patient care and patient care [synthesis?] was translated by pulmonary versus infectious disease versus cardiology.

[01:06:36]

I mean, infectious disease—this is going to be a big jingoistic, but infectious disease is always the first consultant on the case, because if we don't get there and diagnose and manage that patient with the right antibiotics, we know that if it's strep pyogenes infection they're going to die in four hours. So that just changes your mindset as a consultant. So if you look across the country about who has the best show rate once you call a consult, it's in the infectious diseases. And the second is usually cardiology, for similar reasons. The heart can stop functioning for four minutes before you die, and so cardiology (laughs) also gets there fast, and maybe, arguably, even faster than ID. But everybody else, you can argue, doesn't necessarily feel that urgency. So that's the thing that I had to digest and realize is that the sense of urgency isn't necessarily part and parcel to every subspecialty in medicine. That's one thing I had to learn. But so bottom line, though, when I saw the incredible potential here, this was far and away the best leadership job, as Head/Chair of Medicine, that I ever saw. And so I clearly was gunning for this one, and, fortunately, got it. [01:08:01]

T. A. Rosolowski, PhD

[01:08:01]

So what was your vision? I mean, and I always ask this as a two-part question, because someone at this level—I mean, most levels—comes in with a mandate, the official mandate—[01:08:13]



Interview Date: March 20, 2019

David Tweardy, MD

[01:08:12] That's right, that's right. [01:08:13]

T. A. Rosolowski, PhD

[01:08:13]

—from the institution, but then there's your personal mandate. And so I'd kind of like to hear both sides of that.

[01:08:20]

David Tweardy, MD

[01:08:20]

Well, it's interesting: I really got along with Ethan [Dmitrovsky; oral history interview]. I liked him a lot. I knew Ethan, actually, through his work back in the late '90s, because while he ended up, and still is, working in lung cancer, his first area of work was actually in acute promyelocytic leukemia, a type of AML. And so I knew—and his particular tool, if you will, and expertise is the use of retinoids, or retinoic acids, to manage both diseases, and I think he moved into lung because there was just more unmet medical need, really. And he was a consummate academician. He had succeeded all the way up to the level of dean. He was a phenomenally well-funded investigator, extraordinarily well-regarded in the NCI. And so he and I, we spoke very much the same language. So what he wanted of the new Head of Medicine was a realization that the kind of continual expansion that was existing in the Bob Gagel era, that was unsustainable, and there needed to be sort of not necessarily a consolidation but at least a plateauing, and a bit of a reality resetting around, like we talked about, do we really need that position, and let's justify it from a clinical, educational, research perspective and see if we have the financial resources to pay for it. And so I was totally prepared for that, because I'd been at two institutions where that was the rule of the day.

[01:10:11]

And I think he wanted me to kind of organize and get some of the rough edges of the division smoothed over. There were certain—we had—there were three super-sections in the division at that time. A super-section is a discipline of medicine that is distinct from any other discipline, but is not large enough, because of the faculty, to be declared a department, so they were embedded in departments. So benign hematology, which is the study of coagulation, mediated by clotting factors and platelets, as well as premalignant AML syndromes, was managed—there was a group of four faculty, and they were embedded in Benign Hem, in part because the head of Benign Hem was a VA physician before he moved over, and pulmonary medicine is headed by a VA physician who came over to be chair of the department there. So there was a familiarity. And also maybe the other is clots go to the lung and cause pulmonary emboli, so there was that relationship, too. Nephrology went into General Internal Medicine, which was not a bad place to



Interview Date: March 20, 2019

put it, but there was real friction between the chair of that department and the head of Nephrology, so they ended up in Emergency Medicine, of all places. (laughter) Yeah. No really easy way to justify that. And then Rheumatology was in General Internal Medicine, and is still there. We actually created a fourth subspecialty, or super-section, I should say, and that's Hospital Medicine, and they're actually the largest—if they were a department, they'd be the largest department in the division. They'd be 21 faculty this September.

[01:11:59]

So what I think Ethan wanted me to do was kind of recalibrate expectations for those supersections, because they were told—two of them, at least, were told—"You'll be a department; just be patient." And so I had to recalibrate that. And, like I say, there are a few other little bit jagged edges to smooth out, and just continue the service-orientedness of the department, grow research as I could. So it wasn't really a hugely challenging charge. It really wasn't, not for me. I mean, part of it was also, obviously, just being accepted as the new head. The challenge, maybe, for me was coming into a division that the only head of the division since its inception was Bob Gagel, and so I had to make certain that I didn't offend Bob or in any way make people wish for the Bob Gagel days. But I'd done that before with, actually, ID. Dan Musher, who was a giant in infectious disease, I replaced him and I was able to negotiate that skill (inaudible), if you will, without too much difficulty, in part because Dan was really very much in favor of a smooth transition. Bob, to his credit, was similarly interested in not having that be a rocky start for me. So the challenges were there, but not huge. It was something I was more than willing to accept. I was coming into a well-resourced division, and well-run division, with really good leadership, so it was really a no-brainer for me, and it allowed me to continue my research and moving our small-molecule probes into actually convert them to drugs that potentially— [01:13:52]

T. A. Rosolowski, PhD

[01:13:52]

Were there any surprises on the administrative side?

[01:13:54]

David Tweardy, MD

[01:13:56]

Within the division?

[01:13:57]

T. A. Rosolowski, PhD

[01:13:57]

Yeah, or just—or at MD Anderson, too. This is a transitional space between—yeah.

[01:14:04]



Interview Date: March 20, 2019

David Tweardy, MD

[01:14:04]

Yeah. Well, in the department, division itself, not so much, because maybe by that time I was good at quickly sizing up leadership, and nobody surprised me. And really, we managed—we actually have four new chairs. With Cardiology, we'll have four new chairs within our ten departments. But no, I mean, there were no huge surprises. In the institution, yes. I mean, again, I was fortunate to come into the institution in a time when this excessive silo-ism that had been created and I wouldn't say fostered, but enabled, maybe, or at least developed without interference by John Mendelsohn and then Ron, that silo-ism was declining. And actually I think it's largely because of Ethan's efforts. I mean, one of the things you will know, and you probably already sense, is I really thought very highly of Ethan, and I think he was critically important to the leadership of this institution in its transition. And I think Ethan was already beginning to sort of look for emotionally intelligent leaders, not just academically strong or intellectually strong content experts as leaders. He brought in Carin Hagberg, which was a brilliant choice, I think, for Division Head for Anesthesiology. I mean, let's face it: he brought Steve [Hahn] in; he brought me in; and Richard Gorlich, Carin Hagberg—and the existing chair, Tom Feeley, left right before I came. And, actually, Ki Hong [oral history interview] had stepped down, and there was an interim. Dick Champlin was the interim Division Head until Patrick Hwu took the job permanently. And because of a couple interims, because of the couple new -- and I was new, the surprise wasn't that—well, the surprise was that there was such a siloism. The good news, though, is there was a real effort to move in a different direction, and if ... For instance, probably the most fortuitous thing of my arrival in the division head community was the absence of Ki Hong, because if Ki Hong had been here when I came, there would've been some difficult discussions going on at the division head level, I think, because— [01:16:53]

T. A. Rosolowski, PhD

[01:16:53]

What would have been the nature of those discussions?

[01:16:55]

David Tweardy, MD

[01:16:55]

I think that Ki was there when the Division of Internal Medicine was still a department in his division. I think he was interested in maintaining the Division of Internal Medicine in a subjugated, sort of secondary role. Everybody I know who I've interacted with who is from that era, I've had to assiduously work to eliminate that, or to remove that, or to change that point of view.

[01:17:30]



Interview Date: March 20, 2019

T. A. Rosolowski, PhD

[01:17:30]

Where do you think that comes from?

[01:17:32]

David Tweardy, MD

[01:17:32]

I think it comes from the silo building, the—I mean, and the ironic sense of zero-sum game, which still does exist a little bit here, even though it needn't, which is that if I get something it means he can't or she can't, and if he does get something it means I can't. That sort of sense of one-upmanship. And maybe it's more one-upmanship, really, than the zero-sum game notion here. And, in a way, it's kind of the younger brother syndrome. If you're the younger brother, you're not the first, and you're not going to—it's not expected you're going to get regarded in the same way. And it's also, frankly, a very—there's a truth to it, which is, let's face it, the big upstream players in this institution are Oncology, or Cancer Medicine, and Surgery. And they deserve a rightful high regard. I think my job would have been harder to sort of convince the institution—and I'm still working on this, and that is the value added by Division of Internal Medicine is substantial, and includes all of onco-medicine, basically getting the patients to the highest performing status so they can withstand their therapy, getting them through their therapy, and then allowing them to have the best results getting out of their therapy, because they have all the support of the subspecialties of Internal Medicine, the departments of Internal Medicine. And we do that very well. We are the premier onco-medicine group in the country. And the reason that they have the outcomes that they have is, in part, due to our efforts, and optimizing the function of all the critical organs that get damaged as they get their therapies. That's just our medical piece.

[01:19:33]

I think what has happened, which ... You always look for opportunities, in a way, if you're in the situation where you're not necessarily going to be the top position. So let me back up. If you go to any medical center in the country, the number one department is medicine, with few exceptions, okay, and that's like—actually, Baylor. The number one department, arguably, at Baylor is Pediatrics, because of Texas Children's, and the fact that they have a clinical venue that absolutely overlaps and aligns with the Department of Pediatrics there, and it's a huge enterprise. And the former president was both the—President of Baylor College of Medicine—this is Ralph Feigin—he was the President of Baylor College of Medicine; he was the Chief of Pediatrics, or the Chair of Pediatrics at Baylor College of Medicine; he was the physician-in-chief at Texas Children's Hospital. It's a wonderful alignment to have for a department. Medicine, well, actually, had that for a while until the Methodist split. And so adult medicine is always—is the exception there, [in?] medicine. Everywhere else, though, it's the largest department. Numerically, it's the largest; has the largest research budget; and largely has the largest influence, for the most part.



Interview Date: March 20, 2019

[01:21:02]

So coming to MD Anderson, that was, perhaps, the one thing I had to deal with, which is I was coming to head up a Division of Internal Medicine where I wasn't necessarily—the department, or the division, in this case, wasn't necessarily the sort of leading academic division, okay. And I was more than willing to accept that, because I totally bought into the notion of onco-medicine, and the importance of what onco-medicine did in terms of patient care, and saw an opportunity to, I think, raise the sort of image and the portfolio of medicine here, because of the timing, that it was past its growth phase. It was, at that point, the third or second—actually, the second-largest division in the institution, second to Cancer Medicine and one step ahead, just a little bit, to Surgery. And I realized that if Ki Hong had been here, I think that there would have been—he would have sensed what I was trying to do, and it would have probably put more of an effort to sort of undermine that effort. And he was very well-connected at that point. And so it would have been more of a struggle. I think we would have prevailed in the end, but, in other words, allowing us to get to the level of regard I think we should have been, and should be, in the institution. But I think that would have made it harder—

[01:22:34]

T. A. Rosolowski, PhD

[01:22:34]

What are some steps that you took to start to make that happen?

[01:22:37]

David Tweardy, MD

[01:22:36]

Yeah, to make that happen. I think the immediate step I took was just a financial accountability understanding. I took that seriously because of my two institutions I'd been in previously. And Bob, to his great credit, had already pretty much put the Division of Internal Medicine a good distance away and ahead of the rest of the divisions in terms of financial prudency, being prudent financially, and also accountable. So I built on that. And then we had the Epic—I think the thing that really changed the dynamics for us, and the way we were perceived, was Epic implementation. The inevitable happened with Epic, which was revenues disappeared that were formerly there. Because of my financial interest, because of trying to squeeze blood out of a stone at Baylor for 12 years, and just realizing if you're going to—you had to—if you wanted to be accountable and transparent, you had to tell everybody, and they had to believe that you were doing everything you could to make certain that you were getting all the resources you deserved for the effort you were putting in. So that notion of being basically paid for the work you did was deeply embedded, probably from the time I was three years—third grade. I think I told you my first paying job was a paperboy. So that worked, that —I was tapping into that. And so when I came here, and Epic implementation went forward, and we were starting to lose money, certainly some of it was expected, but Bill and I—he was an administrator here—we became



Interview Date: March 20, 2019

aware that some of these money losses just didn't make sense, that there were things we were doing that we were no longer billing for. And so Erica had moved into the Office of Finance as our Financial Director, and so we built the tools to essentially maximize and optimize revenue capture, and we distributed them to everybody in the institution. So those tools—they're called the Cogito Cubes—and the Five Demandments that Bill developed to answer the question: is the financial loss that you're suffering, is it identifiable, trackable, and correctable? We managed to basically correct the Division of Internal Medicine's financial books within two months, and everybody else took four. And the reason it took four is that they started implementing our tools on the third month, and once they did they were back on track. So we immediately established our credibility in the financial aspects of the new world of MD Anderson, which is where we are now. The crisis, of course, was Epic implementation, but, frankly, everybody knew that that was just one of the bumps on the road to a leaner and meaner financial picture for MD Anderson moving forward. So that was probably—that was really—that made people stand up, I think, and take a little more attention.

[01:25:54]



Interview Date: March 20, 2019

Chapter 09

Stepping in to an Institution Undergoing Change

B: Building the Institution;

- B: Building/Transforming the Institution;
- B: Growth and/or Change;
- B: MD Anderson Culture;
- C: Portraits:
- B: Institutional Politics;
- B: Controversy;
- B: Research;
- B: Critical Perspectives on MD Anderson;
- C: Understanding the Institution;
- D: On Research and Researchers:

T. A. Rosolowski, PhD

[01:25:54]

Now, let me just interrupt this piece of the narrative at this moment, because the one thing we haven't mentioned—you came in in 2014, and, of course, Ron DePinho started in 2011, but by the time you're coming in the honeymoon was very much over with Ron DePinho. [01:26:10]

David Tweardy, MD

[01:26:09]

Yes, the second survey, second and first survey was done. McChrystal—not McChrystal, but the former Chancellor—McCraven—had come and visited at the request of the Senate, the Executive Council, the Faculty Senate. The white paper was—he charged them with the white paper. The white paper was written. And—[01:26:33]

T. A. Rosolowski, PhD

[01:26:33]

I mean, let me just ask, because when you were looking at this position you knew. I mean, stuff was in the news.

[01:26:40]

David Tweardy, MD

[01:26:39]

Oh, that's—okay, that's right.



Interview Date: March 20, 2019

[01:26:41]

T. A. Rosolowski, PhD

[01:26:41]

I mean, so that had to be part of what you knew you were walking into.

[01:26:45]

David Tweardy, MD

[01:26:45]

Good point.

[01:26:45]

T. A. Rosolowski, PhD

[01:26:45]

So just set that scene a little bit.

[01:26:48]

David Tweardy, MD

[01:26:48]

Very good.

[01:26:48]

T. A. Rosolowski, PhD

[01:26:48]

And understand why I'm saying this: because this is really what MD Anderson is dealing with right now. I mean, it's the transition, that transition that you are helping to manage right now with the leaders in place now was fostered by all of this stuff that began happening in 2011, so—[01:27:10]

David Tweardy, MD

[01:27:10]

That's right. Very important point, and I kind of—you're right, I skipped over that, and not intentionally. It was because—

[01:27:16]

T. A. Rosolowski, PhD

[01:27:13]

No, that's okay. That's why I'm here. (laughs)

[01:27:17]



Interview Date: March 20, 2019

David Tweardy, MD

[01:27:17]

Right, there you go. To keep me on track. Well, you're absolutely right. The thing that was resonating over at Baylor in the papers was—the one that sort of impacted us the most was the CPRIT shutdown based on a grant that didn't get full oversight, that, in fact, Lynda Chin was the PI of. And actually rumors were circulating, or stories were circulating, around Lynda Chin's management style. And then, of course, socially, well, that was Ron' ... Actually, there's just disgruntlement of MD Anderson faculty that was attached to Ron and Lynda. And the part of the—I told you part of the story when I circulated around looking at the job. I said, fine, we have our own problems. We had Peter Traber at Baylor, and he was kind of an interesting character. And so not all leaders are perfect. And so perhaps that was an important experience I had. I mean, Peter basically—his actions led to the divorce of Methodist. He wanted to head up his own hospital. He did not want to re-sign the hospital agreement with Methodist. They were equally intransigent, and so the split happened. And, frankly, at the time, maybe because I'm a glass-half-full person, I thought, oh, this is great. We can really recapture our own destiny. Because Methodist was the academic DeBakey hospital at the time, early on, when it was first— Baylor College of Medicine moved from Dallas, they were our major [adult?] affiliate. And what you saw was that decline and separate; and, at the same time --as I mentioned to you about Texas Children's being affiliated with pediatrics-- pediatrics' prominence rising, medicine's prominence, surgery's prominence diminishing, relatively speaking. And I actually thought having your own hospital would kind of get us back to a better arrangement with an academic medical center. No, well, that was before 2008, and then 2008 happened and the building is still unfilled down the street.

[01:29:34]

T. A. Rosolowski, PhD

[01:29:34] Wow. So you— [01:29:36]

David Tweardy, MD

[01:29:36]

But so I understood leadership has its upsides and downsides. And so Ron's—I understood Ron came here and was a disruptive force, but I actually, because I was mostly a basic scientist, I thought it was a positive thing, because my evaluation of MD Anderson's scientific acumen and impact was that, gee, they should be getting more bang for their buck. I mean, let's face it. I mean, there's just—and their scientists that I got to know were not as impressive as Baylor scientists. I mean, if you put them side by side, Baylor was kicking MD Anderson's butt scientifically, and it was doing it with reducing resources, and it's still doing that, actually, frankly. So I thought Ron was doing something that needed to be done to get the scientific bang for his buck, or for the institution's buck, that MD Anderson should be getting. And I knew how



Interview Date: March 20, 2019

that creates disgruntlement. I was at Pittsburgh when this same transition occurred, where they were changing the guard, and they were moving unproductive faculty out the door, bringing in young, aggressive people. So it didn't seem to me different, really, than the transition I'd seen when I first arrived in Pittsburgh in '87. So I—and Ron, frankly, was inspirational. He was visionary. In fact, when I was—I think it was right before I took the job—Ron gave a presentation at this nano-medicine symposium at Methodist, and it was the most impressive talk I think I'd ever heard in healthcare. It was molecular to healthcare systems, and I'd never seen anybody do that with that bandwidth—
[01:31:23]

T. A. Rosolowski, PhD

[01:31:22]

He's a very gifted communicator when he has to be charismatic. Very gifted.

[01:31:27]

T. A. Rosolowski, PhD

[01:31:25]

Yes. And so, boy, I said—I thought it was just, okay, disgruntled faculty who wished life was like it was and wasn't like it is. And so Ron DePinho, I only had admiration for him, and I—so it was really kind of a nonissue until I got here. Then I realized the depths of the disgruntlement. And frankly, though, in the end, even now, I don't fully get it. I really—I only have the highest regard for Ron. He hired me. I jokingly tell him he had the intelligence to hire me, (laughter) so that puts you in a certain high rank. And I think that when I learned ... And the other thing about this is there are only a few people who really know the details, right? And I would say as I got to know—and I haven't—as I got to know the details, I might think differently, but because the confidential nature of some of the information around what Ron did, I don't know the details, and, frankly, I don't really necessarily want to know the details. So maybe this is probably—summarizes and says Ron was not a problem for me. I understood he was a problem for many people in the institution, and to that degree I had to sort of incorporate that into my thinking about this was part of, now, the culture of the place.

[01:32:58]

I got to know Julie Izzo very well, it turns out, because one of the things Julie Izzo did is she was, at that time, the President of the Executive Council, the Faculty Senate. We began to build bridges between the Division Head community and the ECMS, and those bridges were largely built by the new faculty, Steve Hahn and myself and Steve Swisher and Patrick Hwu. We were the ones who attended these kind of offline ECFMS division head meetings that we would have once a month. And it was through those meetings that I understood, I got a better understanding of the cultural impact and disruptive impact Ron had on leaders in the Faculty Senate, and I became more sympathetic in the sense that I understood the impact. And they knew, particularly Julie knew, a lot of the backstories that she was, rightfully, not willing to share; or I didn't



Interview Date: March 20, 2019

even—I didn't ask her to share, because, again, I'm not one to really necessarily want to know information that—maybe I'm just a little bit opt—I don't know. I'd like to think the best of people, maybe is what it is. I don't engage in hearing stories that, without hearing the full story, will only give me a negative impression, if I can't back it up.

[01:34:28]

And when I was Chief Medical Resident I learned one of the most important lessons, I think, of administration from my boss at that time, the Chair of Medicine, from Chuck Carpenter. And there was a disruptive episode that led to shouting, and, I think, bad care in the end. And so it turns out it was the day after that we had a routine meeting, and he asked me, "Well, David, what do you know about this?" And I said, "Well, this is what I heard." And Chuck said, "I don't want to know what you heard. I only want to know what you know, and what people who were there told you." Because he was very mindful, and I think I've learned that ever since, is that it's that old telephone circle. That by the time it got to you, who knows how much of that information was actually accurate, versus being distorted by the perceptions and the emotions and psychological makeup of the person who's recounting the story. So I tend not to want to hear stories that have been distilled, or—because I'm always uncertain about their veracity, so—[01:35:36]

T. A. Rosolowski, PhD

[01:35:36]

I can understand that, certainly, but I think probably what you began to appreciate is that, I mean, the morale had been very much impacted.

[01:35:49]

David Tweardy, MD

[01:35:48]

Oh, that's right. So irrespective of the—

[01:35:51]

T. A. Rosolowski, PhD

[01:35:50]

I mean, whatever other people were doing—(laughs)

[01:35:52]

David Tweardy, MD

[01:35:51]

Right, that's right. Irrespective of the accuracy of whatever, there was a morale problem, and, frankly, that's where I picked it up. I mean, why there was a morale problem was important in terms of what was the perception. The perception was very important, and the perception was bad, and it needed to be—and the consequences of that bad perception needed to be rectified.



Interview Date: March 20, 2019

There had to be more transparency. There had to be more openness, more—and I was all for that. And so the process that then ensued, which is ... The fact is that Ron was asked to bring up a COO. Steve Hahn was asked to do that. I think the division head community felt very supportive of that, because by the time—this is almost maybe a year and a half into Steve's position here, he had established himself as a very emotionally stable, intelligent, and just bright, articulate, engaging, energetic individual who really, really let everybody have their say whenever—and was very respectful of everybody. I think he had a great way about him. And so when he was moved into the COO position, I think that was certainly—many of the division heads felt that they had now a voice at a higher level. I felt we had just a very effective communicator, and a very emotionally stable guy in a position of great importance during this transition.

[01:37:25]

T. A. Rosolowski, PhD

[01:37:25]

Since we're talking about morale, were there some ways in which you addressed it inside the Division of Internal Medicine?

[01:37:33]

David Tweardy, MD

[01:37:33] Yeah. [01:37:33]

T. A. Rosolowski, PhD

[01:37:33]

Or, I mean, was it a factor for you?

[01:37:35]

David Tweardy, MD

[01:37:35]

Yeah, I think it was, and the first thing I think I didn't do --which was, I think, smart and it was a little bit against my initial instincts—was to discredit the Executive Council, the Faculty Senate, the Faculty Senate in general. There was a large fraction of the division that just thought they were a bit on the fringe, but I, relatively early on, once I got to know Julie and got to know the issues around the ECFS and the sources of their discontent --and the sources of the white paper--I realized relatively early that this is not a group you can discount and ignore, because they were obviously—they were reaching levels in the system, and getting a voice, and getting heard in a way that made you want to realize you have to incorporate them. You had—[01:38:30]



Interview Date: March 20, 2019

T. A. Rosolowski, PhD

[01:38:30]

Well, and they were going through a process, too. I mean, there were certain voices that were very loud—
[01:38:33]

David Tweardy, MD

[01:38:33]

Yes.

[01:38:33]

T. A. Rosolowski, PhD

[01:38:33]

—in Faculty Senate early on but that transitioned over time and became much more effective. [01:38:39]

David Tweardy, MD

[01:38:39]

And I think Julie deserves a huge amount of credit. I've always—I've said that to her several times. We worked together on the SHC Committee, where we, I guess, probably got to know each other best, which was the Strategic Hiring Committee that during the Epic shortfall of resources and moneys there had to be a—there was the layoff, and then there was a post-layoff rehiring: it had to be done with a little more oversight, and SHC was put into place for six months to do that. I mean, I think Julie was critically important in that transition. I think that's why she sits in the CMU's office to this day, because I think she and Steve got along very well. And that dyad, if you will, was one of the elements of the success of the transition. And so the way I dealt with the morale problem within our division was—frankly, we didn't have as much a morale issue as other departments or divisions had. I can only guess as to where they were really most problematic. But what I was very interested in doing was legitimizing the Senate here. And, in fact, I encouraged—in fact, initiated—I insisted that every month, every meeting of the Executive Council, we would rotate a report from the Senate, and making certain that their voice was being heard by the leadership in the division. It turns out we stopped doing that because each department started maintaining that practice. [01:40:12]

T. A. Rosolowski, PhD

[01:40:12]

That's interesting. Yeah, that's interesting. I mean, it's a transparency of a different sort. You talked about the financial transparency, and, yeah, that's very—[01:40:19]



Interview Date: March 20, 2019

David Tweardy, MD

[01:40:19] Yeah, this one was just— [01:40:20]

T. A. Rosolowski, PhD

[01:40:20] Cultural transparency. [01:40:21]

David Tweardy, MD

[01:40:21]

It was, and it was not a ... I wanted to remove the "we/they" concept and say, no, we're all MD Anderson, and those voices need to be listened to and incorporated. And, frankly, that was completely ... Subsequently, it was subsequently sort of reinforced by the creation of the SGC [Shared Governance Committee, and so if I had to say what are the most important things that transitioned us successfully during these turbulent times, from the Ron DePinho era to the Peter Pisters era, it was Julie Izzo and her leadership position. I think her predecessor was also very important. He just wasn't there as long, and he was a radiologist, and I'm forgetting his name. Ann was also—Ann Killary. But I think Julie was probably the most effective. I think she was the most articulate, and really got—and willing to kind of bridge. One thing about Julie was she wanted to fix it. She didn't want to say, "Hey, we got this problem." She wanted to say, "Hey, we got this problem and we've got to fix it, and these are the things I'm thinking about. What do you guys have to say in the division head? How can we do this?" And that's what was critically important about her role. I think that COO position, Steve moving up to the COO, allowed for more the smoother transition, because it could have been more abrupt and more disruptive. I think Marshall [Hicks; oral history interview] stepping in as the interim president was absolutely critical. I mean, Marshall was—and I've told him this on a couple of occasions—he was the perfect person for that position. They couldn't have—he couldn't have—they couldn't have cast somebody and gave them the qualities that that person needed better than Marshall had. I think the SGC, which was—it kind of predated that, because it was—in effect, it was there, actually as a result of the white paper. It was one of the major action plans that emerged, that was implemented out of the white paper. The SGC was critically important. It allowed for the Executive Council of Faculty Senate to have a voice, a seat at the table, and it became a very important advisory and sort of clearinghouse for many of the issues that were bothering the faculty, and particularly the Executive Council of Faculty Senate. I think the McChrystal Group, the decision that Marshall and Steve together had to let's go and take this to a group that has insight and has experience in management and in transition, and I think the retreat we had and the strategic plan emerged out of the McChrystal Group retreat, which was ... Essentially, the most immediate residual of that is the operating priorities, the OPEs. And the quarterly rolling operational priorities reviews, the ROPRs, I think, is just incredibly important for transitioning



Interview Date: March 20, 2019

the organization, too, because it allowed for issues that did bubble up or came to the SGC and needed to be resolved—there was an ad hoc mechanism that McChrystal put into place for dealing with them. McChrystal fully implemented, and wanted to see implemented, a cadenced operational priority system, and that's what initiated and came out to be the operational priorities and the ROPR quarterly reports. I think they resolved a huge number of issues that were plaguing the institution for a long time.

[01:44:14]

T. A. Rosolowski, PhD

[01:44:14]

Let me say just that we stop here, because we're almost at time, and also this was a great overview, and I actually would next time like to go in and ask for some specific examples, because I think that will add some richness to the story. But this has been really, really great, so thank you.

[01:44:34]

David Tweardy, MD

[01:44:34]

Well, no, you're welcome. It's always fun. This is really fun.

[01:44:37]

T. A. Rosolowski, PhD

[01:44:36]

Yeah, it is fun. (laughter)

[01:44:37]

David Tweardy, MD

[01:44:38]

I mean, you're one of the best listeners I've ever met. I really—

[01:44:43]

T. A. Rosolowski, PhD

[01:44:43]

Well, thank you.

[01:44:43]

David Tweardy, MD

[01:44:43]

No, no. Obviously, maybe you're a professional listener and you've developed skills in the area. [01:44:50]



Interview Date: March 20, 2019

T. A. Rosolowski, PhD

[01:44:51] (laughter) Yeah, a bit. [01:44:51]

David Tweardy, MD

[01:44:52] But still, it's great to talk with you. [01:44:55]

T. A. Rosolowski, PhD

[01:44:55] All right, great. Well, thank you. Thank you so much. [01:44:57]

David Tweardy, MD

[01:44:57] You're welcome. [01:44:58]

T. A. Rosolowski, PhD

[01:44:58]

And I want to say for the record that I'm turning off the recorder at about two minutes of 4:00. [01:45:02]



Making Cancer History®

David J. Tweardy, MD

Interview Session Three: April 18, 2019

Chapter 00C *Interview Identifier*

T. A. Rosolowski, PhD

[00:00:01]

I'm Tacey Ann Rosolowski, and today is April 18th, 2019, and I'm on the 12th floor of Pickens Tower for my third session with Dr. David Tweardy, so I wanted to thank you very much for making time in your day for this. [00:00:15]

David Tweardy, MD

[00:00:15]

My pleasure. It's always a pleasure chatting with you.

[00:00:17]



Interview Date: April 18, 2019

Chapter 10

MD Anderson in Transition: Rebuilding and Integrating Relationships Before and After Dr. DePinho's Resignation
B: Building the Institution;

Codes

B: Building/Transforming the Institution;

B: Growth and/or Change;

B: MD Anderson Culture;

C: Portraits;

B: Institutional Politics;

B: Controversy;

B: Research;

B: Critical Perspectives on MD Anderson;

C: Understanding the Institution;

T. A. Rosolowski, PhD

[00:00:17]

Well, thank you. Yeah, it is, always interesting conversations. Well, we were strategizing before the recorder went on, and wanted to pick up with where we left off last session, where you had started to talk about the turbulence that was in the institution, reflected a bit on work the McChrystal Group did in instituting ROPR as a way of monitoring the re-stabilization of the institution. You also talked about the important landmark of appointing Dr. Stephen Hahn as Chief Operating Officer, and then the important work that Ann Killary and Julie Izzo were doing on Faculty Senate. So there were a number of—you called then the three factors, coming together to kind of put the institution on a track. So I wanted to ask you—I mean, start where you would like. I mean, certainly ROPR is one to go a little bit more deeply, but I'm interested in that process: Dr. DePinho resigns, how the institution begins to get back onto a stable footing.

David Tweardy, MD

[00:01:24]

Right. So, in fact, those people that you recounted that we had chatted about last time are critically important, and, of course, with Ron stepping down a critical additional person is Marshall Hicks [oral history interview] to add to the mix of individuals who I think were critically important in having as smooth a transition as you could after Dr. DePinho's stepping down as the President. I think that the critical—there's kind of two—sort of at least two camps, if you will, within the institution that were critically important to stabilize. In my mind it was the camp that includes the President—interim President in this case—Marshall and Steve, and their



Interview Date: April 18, 2019

communication with the two major leadership groups within the institution, the division heads and the chairs. And I think that was very effective, and I think —maybe because it was already in existence, the division head community would meet regularly, once a week. And Marshall actually established tremendous credibility within the division head community by virtue of being the chair of the division head group. And, actually, Steve Swisher was the cochair. And it was around the time that Dr. DePinho stepped down and Marshall stepped up to the interim role that the transition—there was a planned transition from Marshall stepping down as the Chair and Steve, as the Co-Chair, would step up to the Chair position. And that did transpire. Steve stayed on, actually, for almost two years in that role, as I recall, because this was during because the first years, it was—maybe even towards right before Marshall stepped up that Steve stepped into his job so that he stayed on for a total of two years. But Marshall was --by virtue of his leadership within the division head community-- was immediately recognized as, arguably, the best person to take on the interim presidency. So he had immediate credibility within the division head community; and Steve, who had been a member of the division head community but hadn't been long enough to kind of establish at least the sort of level of participation in that division head group that Steve had, I mean, he then moved up to the COO's office. But by virtue of his participation in that division head community had earned tremendous regard and respect of that committee—of that group. And so having Marshall as the interim president, having Steve as the COO, I think there was immediate connection with the division head community. There was immediate establishment of trust and engagement, and it was bidirectional, and very important for the success of anything that transpired in terms of the transition.

[00:04:47]

The thing that happened very quickly, too, was actually, it was a report that came out of ... One of the strategic plans, or strategic initiatives of the strategic plan was developed in 2013, 2014, which was the pyramid plan that had multicolored ... One of them, of the 130-some committees that were part of that strategic plan, was to reevaluate the chair position. And it turns out that charge, the charge for doing that evaluation and getting engagement from the chairs and others, it was chaired by Steve Sherman and Karen Lu. And they—it might even be before this time, this transition to Marshall and the interim President's position, but they produced a report. One of the recommendations—there were several very good recommendations that came out of that report, but one that has particular bearing on what subsequently transpired was they felt, just as the division head had this committee that met regularly: that the chairs should form a similar sort of body, if you will, of chairs. And, indeed, what emerged from that was I think one of the, again, top five most important developments in the institution in the five years, four or so years that I've been here, which is the Community of Chairs was formed. That was a recommendation from that report that Steve and Karen put together. It turned out, as we were realizing—and probably, at least in my mind, as I was realizing how important the division head community was in the transition, because of the connection we had with Steve and with Marshall, it just—when the idea of having this Community of Chairs become a reality, as opposed to recommendation, it



Interview Date: April 18, 2019

just made absolute sense. And actually Steve Hahn, I would say, as much as anybody, was a strong advocate for having that entity, the Community of Chairs, be created. [00:06:58]

T. A. Rosolowski, PhD

[00:06:58] Why was that so important? [00:07:00]

David Tweardy, MD

[00:07:00]

Well, because what we needed—I think what the organization needed is a means of communicating effectively, particularly in the positions of the COO and the President's office, effectively with the leadership within the organization. And that being somewhat of a traditionalist, in terms of leadership structures and my thinking around them at academic medical centers, you already have basically created this chair structure. Then here --which is they had the division head structure—and the division heads were engaged, but the Community of Chairs were not, fully. Frankly, they were critically important to get engaged in two-way communication for the purposes of understanding where leadership wanted to move the institution in the short term, until a new permanent President came. Also getting input from the chairs as to what was going on in your departments that were issues of concern and needed to be addressed in an immediate fashion. Because there was enough turbulence that you didn't want anything to go -- as a leader in this organization, you didn't want anything to go too far forward without some sort of oversight, or at least communication between all of the effective parties involved.

[00:08:37]

T. A. Rosolowski, PhD

[00:08:37]

Can you give me an example of a theme that came up real early, that these new communities of division heads and chairs, it was really helpful in pushing it forward? [00:08:49]

David Tweardy, MD

[00:08:49]

Yeah. That's a very good question. Actually, probably the one that—there are a couple that I can think of, but the one that I think was immediately pressing was the reduction of the force. Preceding that was the implementation of Epic. But that --the implementation of Epic-- was managed more just in a standard operational process here. But the reduction in force decision and strategy needed to be vetted effectively throughout the organization. And I think the Community of Chairs, at least, were part of the—were engaged in, at least, the discussions



Interview Date: April 18, 2019

around that, the need for that, and how best to proceed moving forward with that. I believe the Community of Chairs may have been in existence even before Dr. DePinho stepped down. So my timing here is—I may be blending or misplacing the initiation of events, because I think the RIF actually occurred before Dr. DePinho left, and constant—and that before he left, I think Steve had already been moved to the COO position. Then the budgetary implications of the Epic implementation became apparent, and there was an analysis done that in order for us to maintain our financial stability we needed to have a reduction in force. And I think the Community of Chairs helped to message that. That was the important thing: how to effectively message the first reduction in force this institution has had since 2008, 2009. And that was—I think their engagement helped to move that effectively throughout without having more interruption and destabilization, if you will, within the organization. So the engagement of the Community of Chairs, in addition to the division heads, which already had been in place, and the two new leaders in the COO and interim President position, with Steve and Marshall, I think that allowed for the kind of open channels of communication, bidirectional, that allowed for the leadership on the academic side to maintain stability and to move the institution forward in a productive way.

[00:11:57]

The other major component of, I think, leadership structure that was critically important you alluded to, which was Julie Izzo, Ann Killary, and then there was a faculty member before, or Executive Council of the Faculty Senate president before Ann, or—because there were three. One of the things that we took from the Executive Council of the Faculty Senate in the Division Head Council, if you will, was engagement of the current president, past president, and future president. And Ann was the former—there was a gentleman in Radiation and Diagnostic Imaging who was very important—I considered them part of a triumvirate—and he—it was Gary Whitman—

[00:12:59]

T. A. Rosolowski, PhD

[00:12:59]

We can double check and it can be put in later, yeah.

[00:13:03]

David Tweardy, MD

[00:13:02]

Yeah. Gary I'm pretty confident on, and I think it started on—Whitman is pretty close. Anyway, it was the three of them that started meeting with small groups with the division heads, and that engagement between the Executive Council of the Faculty Senate's presidents, and a group of division heads helped to maintain stability with the entire Faculty Senate. And, indeed, the division heads and the Faculty Senate met on a couple of occasions. The meetings that we had with those three presidents, though, I think on a regular—on a monthly basis, actually, again, helped to stabilize it, even before Dr. DePinho stepping down. In fact, in that setting it was



Interview Date: April 18, 2019

Steve Hahn, myself, and Patrick Hwu, and Steve Swisher, who tended to be the division heads that met on a regular basis with the Executive Council and the Faculty Senate. When Steve moved over to the COO, we kept meeting, and then the Executive Council of the Faculty Senate, particularly Julie Izzo, who was probably mostly—in the position of the president of the Executive Council of the Faculty Senate during the most, maybe, transitional time. She was critically important in maintaining civility, really, in some ways, between the Executive Council of the Faculty Senate and the Senate in general, and the Leadership Office on the 20th floor. Because I think there was some discord, clearly, between those—the 20th floor of MD Anderson and the Executive Council of the Faculty Senate. And I think—[00:14:55]

T. A. Rosolowski, PhD

[00:14:55]

Well, I'll just say for the record—I was sort of hesitating about it, but I will—and my office is on the 21st floor, which is right next door to the conference room where Faculty Senate would meet. So I was very aware of the fact that when Dr. DePinho, when his resignation was broadcast—which was I can't remember what time of day—the Faculty Senate was meeting, and they cheered. So there was so much acrimony.

[00:15:28]

David Tweardy, MD

[00:15:28] Yeah. [00:15:28]

T. A. Rosolowski, PhD

[00:15:29]

I think it's very significant that pretty much everything you've described so far is the process of setting up lines of communication, which had been severely broken.

[00:15:37]

David Tweardy, MD

[00:15:36]

Yeah. They had been. And that's what I learned. When I came, there was an attempt to repair them, but that was something that had happened prior to my arrival. And pretty much a lot of—exactly. I think what I outlined to you is exactly that, is attempts to develop lines of communication to recreate or reconnect groups that had been disconnected—[00:16:01]



Interview Date: April 18, 2019

T. A. Rosolowski, PhD

[00:16:01] And were mistrustful, and— [00:16:03]

David Tweardy, MD

[00:16:03] And—right, that's right. [00:16:04]

T. A. Rosolowski, PhD

[00:16:04] Absolutely. [00:16:04]

David Tweardy, MD

[00:16:05]

So bottom line is those things—those were the two, or several sets of interconnected liaisons that were important. It was the division heads with Steve and with Marshall, as he became the President, and the division heads with the Executive Council of the Faculty Senate, and then Steve in the COO's office, and Marshall as he stepped into the presidency, with the Community of Chairs. And, actually, there was also another layer, which was of integration that members of the Community of Chairs went through a similar sort of organizational mindset: they developed a president, past president, and future president, and members of those three would also come to the division head meetings on a regular basis, and still do. So there's integration between the division heads and the Community of Chairs that's very effective. But these types of efforts to communicate and to engage stakeholders across the leadership structures that exist were, I think, really, really critical.

[00:17:09]

T. A. Rosolowski, PhD

[00:17:09]

Now, as you were coming to these meetings at this time, as a division head, what were some thoughts that were in your mind about issues that you had locally that needed to be addressed? [00:17:21]

David Tweardy, MD

[00:17:22]

It's a good question. My position often was to listen and learn about broken communications, and the dysfunction that that caused in other areas of the organization. When I came to be the division head, I was very fortunate to inherit a group of chairs and super-section leaders who



Interview Date: April 18, 2019

were very integrated, very aligned with the mission, and very outstanding leaders of their units. Everybody could make, or some of them could make some improvement, but they basically started out at a very high level of function. My job was to, first of all, quickly recognize how effective they were, which I was able to do pretty quickly—maybe because I've been in the business for so long it's not hard to figure out who's doing a good job at leadership and who isn't. Then just really reinforce them in their effort, and keep them informed. So I felt one of my major jobs was to communicate all of what was going on in the division head community before the Community of Chairs got fully engaged, and as they have become fully engaged my job of communicating to the chairs and the super-section chiefs here, it became a little less critical. But I needed, immediately upon hitting the ground here, needed to, in fact, do a couple of things. One is to make certain they understood what was going on at the division head level, and what I was doing to help represent them at that level. And I think I established my bona fides in that respect. I was considered a good champion and voice for the division, at the table of the division heads. So that was the first thing. But then communicating all of the changes that were going on to the Executive Council—that is, the chairs and super-section chiefs here—and take feedback from that group back to the division heads. That tended to be a little less of an issue because, again, our alignment as a division with the institution was, I think, much more substantial, or just more substantial; I won't make that "much more." But it was more substantial, or it was well-established. Let's not do a comparison; it was just pretty wellestablished. We just had to kind of tweak it a bit, and by virtue of maintaining the communication, that alignment was able to be maintained without any major perturbations, despite all the things that were going on on the 18th and 20th floor.

[00:20:19]

So being an honest broker in the view of my Executive Council, being open and absolutely honest in communications of what was going on. The other thing I did is that I was really struck by the level of alarm that the Executive Council of the Faculty Senate had with regard to the organizational structure, and you pointed it out, with the leadership. Unlike any other place ... Although I think Pittsburgh was a little bit like this; the Faculty Senate at Baylor actually wasn't even in existence until after I left; they created a Faculty Senate in the last four years since I left. Pittsburgh had a strong Faculty Senate, back in 1985, when I first—I started in '87—and it basically was—it became decreasingly powerful because of the massive transition that that organization underwent, and the Senate, which was sort of in the oppositional position, could not get great traction as the institution moved in what, in the aggregate, over time, turned out to be a very positive direction. I mean, Pittsburgh moved up to one of the top five medical schools in the country on the basis of all of the changes that the Vice Chair for Health Sciences was initiating, with substantial resistance on the part of the Senate. So when I came here, I drew some similarities in some respects to the University of Pittsburgh situation, but I also realized that there were some differences. In particular, I thought that the establishment—the Senate here was better established, had various sort of support of the faculty, in terms of the workaday ground, the faculty on the ground level, but realizing their very potent connection with the



Interview Date: April 18, 2019

chancellor of the system, realized you could not do maybe what was done in Pittsburgh. There just was too strong a connection. Their voice was being heard by the chancellor in his office, so we needed to be very straightforward and open with our faculty, who were on the Faculty Senate. So what I established was a monthly report by a Senate member to come through and present to the Executive Council, just so our Council knew what was going on in the Senate. And by virtue of setting that example, then the practice of having the department faculty rep present at those faculty meetings at the department level kind of regrew a bit. And so I think what I demonstrated a little bit is my respect for the Senate, and my unwillingness to discount them. And that paralleled my regular meetings with the Executive Council of the Faculty Senate, is I learned their concerns and became more aware of what their positions were, and why they held those positions.

[00:23:49]

T. A. Rosolowski, PhD

[00:23:49]

Were there specific ways that you used that information at different levels to smooth waters, move—? Tell me about your roles in that regard.
[00:24:01]

David Tweardy, MD

[00:24:03]

Well, what I did in terms of ... In our division, among our chairs and section chiefs, there was not unanimity around the seriousness with which one should take the positions of the Senate. So I guess what I did is I didn't necessarily legitimize every point that they were making, but legitimized them as a legitimate and important group to listen to moving forward, and—[00:24:37]

T. A. Rosolowski, PhD

[00:24:37]

Yeah, you mentioned this last time, and now, given all that you've told me about these lines of communication, I'm starting to see more clearly how important that was, that really these lines of communication had really not been activated prior to that time. [00:24:53]

David Tweardy, MD

[00:24:53]

Yeah, and, in fact, the thing that—it's—I don't know. While I was a new kid on the block, and therefore a bit of an unknown entity when I came, there was no question that Steve was very similar in that regard. He came a month after I did. But it was very clear that the people who would meet with the Executive Council of the Faculty Senate in the division head role were—I mean, the ones that were volunteered to do that were the new guys, the new folks. It seemed to



Interview Date: April 18, 2019

me that the reason for that was that some of the more longstanding division heads had had a history with that organization, and that leadership group, and it was maybe not going to necessarily lead to productive and open-ended conversations. So I think we were—Steve and I in particular, I sense, were viewed as sort of unbiased, maybe, and therefore neutral participants in conversation. I think they understood very quickly I realized the importance of having good communication with that group. So, bottom line is that it was very important for the Executive Council of the Faculty Senate to have a way of communicating with leadership. I think they felt, as you say, they felt shut off as a result of changes that occurred prior to my arrival, and the way that communications did occur between the 20th floor and the Executive Council of the Faculty Senate. So they needed to have communication with a leadership group, and I think the division heads served a useful purpose in that. And so, yeah, I would say we were—the sort of just openmindedness that—and Steve Swisher and Patrick all ... I think, actually, Patrick probably made the greatest move from being a little bit cautious about interacting with the Executive Council of the Faculty Senate, then became very strongly embracing them as very important voices to make certain were heard and integrated in the decision-making process. I think Steve and I came in with more of that a priori, but Patrick, who obviously had been here quite long, was able to change his thinking a little bit around that role, or the role of the Executive Council of the Faculty Senate. To his credit he was able to slightly change his opinion on that. And I think by virtue of him doing that, Steve Swisher, I think, came in pretty much openminded, as well, but obviously having more history, and then Steve and I. I think with the four of us legitimately and very conscientiously interacting with the Executive Council of the Faculty Senate, that really helped to sort of reduce some of the frustration that that group had with regard to communication with leadership.

[00:27:58]



Interview Date: April 18, 2019

Chapter 11

The McChrystal Group, the Rolling Operational Priorities (2015, and Observations on Strategic Planning

B: Building the Institution;

Codes

B: Building/Transforming the Institution;

B: Growth and/or Change;

B: MD Anderson Culture;

B: Institutional Politics;

B: Controversy;

B: Critical Perspectives on MD Anderson;

C: Understanding the Institution;

T. A. Rosolowski, PhD

[00:27:58]

So tell me about kind of the next phase, working with the McChrystal Group and ROPR [Rolling Operational Priorities Review], which created these big for for people to get together and start talking about what was happening. So give me your insight into that. [00:28:14]

David Tweardy, MD

[00:28:14]

Well, I think that McChrystal Group allowed for an outside entity to come in, evaluate what was going on, pretty much as they tried to in that one-year engagement throughout the institution in terms of how the decisions were made. I think their focus really was around decision-making. [00:28:33]

T. A. Rosolowski, PhD

[00:28:33]

And that was 2015, correct, that they came? [00:28:35]

David Tweardy, MD

[00:28:34]

Yeah, as they began, yeah. And they were, in part—I think that's one of the major contributions that Marshall [Hicks; hhh] had to the organizational transition was he was the one that tuned us into the McChrystal Group. They went through an open bidding process. There was an RFA



Interview Date: April 18, 2019

sent out to determine what one of these leadership consulting groups would engage with MD Anderson to help us move forward, and they made the bid. They had a little bit of an inside track, because we'd already brought them in as a consultant—or I shouldn't say "we." I think at that point Marshall and Steve, as the leaders of the Chairmen of the Division Heads Committee, brought them in to start to get a discussion going, and just to see what an initial take would be. And then, when the RFA went out they won the RFA. Then they became fully engaged for a year or so contract. And, again, their focus—because I think one of McChrystal's claims to fame was how he deconstructed and reconstructed the decision-making process within the special operations in Iraq and Afghanistan, and he moved it totally from a centralized process to a local. And that concept of decentralization of leadership really resonated with many people here, as you might imagine.

[00:30:15]

T. A. Rosolowski, PhD

[00:30:15]

Yeah, in that historical context, absolutely.

[00:30:18]

David Tweardy, MD

[00:30:17]

In that context, exactly. And so they brought in—and that was what they ... We all went over, or up to, Alexandria, their headquarters in Alexandria, Virginia. We had a day retreat, and they walked us through an exercise that was—they essentially ... Their headquarters has got a large room which is built essentially like central command in a military operation. And they walked us through exercises to, in a way, not train us, because it was too short a time to truly train, but at least to give us an idea of how he, in his reconstruction of the division decision-making process in the military, in that field of battle, how he basically reconstructed decision making. And so it was a very helpful exercise. I think we then, essentially ... That was the beginning of the engagement, or maybe a month or two into the engagement, and then we essentially came here. They came here, and stayed on campus for a year, to investigate or observe all of the committees and other decision-making bodies within the organization: how they proceed to make decisions, and basically made recommendations of how that could be improved. And there were two major work products that came from that. One was a presentation around the decision document. It was like a format of how you walk through decision making in terms of what are the issues, what information do you have, who are the stakeholders, what's your timing for the decision, what input do you need beyond what you have so far, and then what are the options. And after this has all gone through the presentation, where it would go to a decision-making body, would then be given options, one, two, and three: these are the options; these are the upsides; these are the downsides. Then the decision-making body—this is where most of this sort of rollout was, at this time, at the SGC, the Shared Governance Committee—would then vote and advise the president from the point of view, in their minds, as the SGC, what would they recommend to the



Interview Date: April 18, 2019

president. This, again, is already ... At this point in time I think Ron [DePinho; oral history interview] is still in place, and the COO, Steve, was still in place. And so we began to exercise this model of decision making within the SGC. [00:33:05]

T. A. Rosolowski, PhD

[00:33:05] Interesting. Okay. [00:33:06]

David Tweardy, MD

[00:33:06]

Yeah. Then the other major work product was a cadence around decision making, which is ... So, first of all, what are you going to make—what do you want to make decisions about? And once you determine that there are four or five or six—and it turned out to be seven—areas that you want to be making decisions about, how do you decide what are the important decisions in those spaces? How do you decide, or how to operationalize the decision-making process within that space? So it turned out that this was the beginning of their operational priorities. There were seven. Education was number three. That was the one I was in charge of. And by being in charge, there was ... So the operational priorities, and the rolling operational priorities review became the mechanism of decision-making and decision implementation. Now, the actual—the third concept that was critically important, and sort of a theme that drove through that process was the concept of dyads. Every leader ... Every ROPR, every operational priorities group, was led by two sets of dyads, which was—at the highest level, these were like—there was a sponsoring dyad. I was the academic sponsoring dyad of the educational priority, and the administrative one started out being Steve Hahn, and then he just became too busy, as you might imagine. He stepped down and Marshall [Hicks; oral history interview] stepped in as he stepped down as the President, interim President. And then there was a true working dyad. These are the ones that actually did more of the work. A sponsoring dyad did an oversight of the processes that were ongoing in that operational priority, but the working dyad was a faculty leader and an administrative leader in that space. So the faculty leader was Diane Bodurka. The administrative leader was [Robert] Tillman. [00:35:23]

T. A. Rosolowski, PhD

[00:35:23] Bob Tillman. [00:35:24]



Making Cancer History*
Interview Session: 03
Interview Date: April 18, 2019

David Tweardy, MD

[00:35:24]

Bob Tillman. And for education. And so then they brought a committee of people together, interested people in education. I'm just giving the way the process worked for the OP3, which is the educational. They identified issues, and then prioritized those issues, and then ran them through a committee of sponsors for prioritization and authorization to move forward. The moving forward occurred in three steps. Plan it—okay, that sounds like an important issue, please go ahead and plan it. Secondly, then, budget it out; and then, thirdly, approval. And it was a really --really an exercise to do across these seven, original seven operational priorities: how do we decide—first of all, how do we decide what are the areas we need to really begin to think about in a more systematic way operationally, what are the problems and issues we should address in that area, and then how do we actually make decisions around those suggestions that were made at the grassroots? Which is a wonderful thing about it: we really got ideas from a whole group of stakeholders which heretofore had not really been engaged in making decisions in the institution. Then they were prioritized and then implemented. And, in fact, the beautiful thing was it went all the way through implementation, and some of the operational priorities actually were deactivated because they had done their job, or they had done what they could do. Like in education, they'd done a couple things and done the rest of the educational priority entity and existing decision making would roll into the new strategic plan, because we're now about to begin. So it was, for me, at least, who -- I am very process-driven. I don't like to not finish what I start, because I don't like to waste time. But to have something be as, I think, well-structured, in terms of—and go from start to finish, was really very edifying. And I think it was edifying not only for me but many others in this institution, who felt that ... And I know Steve Swisher would say this a number of times: is that we're really good at planning here, but we're not good at doing. And this was a nice example of how we can change that thinking. We could actually not only plan and decide what we wanted to do, but we could execute. We could actually complete it, and then we could decommission it, too. And that was ... Because the other thing about this institution that is well known to many is that once something gets started, it may not do much, but it never dies. It never gets decommissioned. It just continues to exist, because it for unclear reasons.

[00:38:29]

So that was, I think, a great exercise, and that really came out of the McChrystal engagement. So when they left—I think it was actually extended, maybe, for another six months—18 months later, I think we had in place a very functional means through which we would make decisions in important areas of our mission, implement them, and decide whether or not we could then decommission the group that made those decisions. So that was —and I that's, I think, the foundation on top of which the new strategic plan will build. Because people sort of ... I'm a little more optimistic in my assessments than many people, but I think that that pyramid plan was actually beneficial. I can point to one major benefit, which was the report on the chairs, on how to restructure the chairs, the fact that it led to the Community of Chairs, and led to a—laid the



Interview Date: April 18, 2019

groundwork for the McChrystal Group to come in and even be more methodical in implementing a means of actual change creation that actually gets—the institution actually participates in and follows through on. So I view that McChrystal engagement as critically important in leading to ROPR, and I'm really very interested in how the strategic plan will then come together and build on what we now have as a very effective, I think, existing ROPR structure. [00:40:20]

T. A. Rosolowski, PhD

[00:40:20]

Well, let me ask you, because you alluded to the fact that the pyramid plan was controversial, maybe you could talk a little bit about that, and also alternative views of McChrystal, because I doubt very much that everybody was a hundred percent (laughs) behind that. [00:40:35]

David Tweardy, MD

[00:40:35]

You know, it's interesting: I would say in terms of the first one, I think because my engagement—because it was already in place before I came, I came into the learning mode, not in the planning mode, of that strategic plan. I had been involved in strategic plans at multiple institutions, so I was more interested in learning and seeing what I could do to move that process forward. I didn't think that because of its ... I mean, it was a very broadly-based. There were lots of participants—it had 130 to 160 committees that actually—
[00:41:23]

T. A. Rosolowski, PhD

[00:41:23] This was the pyramid plan? [00:41:24]

David Tweardy, MD

[00:41:24] Yep. [00:41:24]

T. A. Rosolowski, PhD

[00:41:24] Oh my heavens. [00:41:25]



Interview Date: April 18, 2019

David Tweardy, MD

[00:41:25]

Yeah. It was a massive, massive sort of undertaking. I think the reason it failed, in some respects, is there wasn't the follow-through that the ROPR implementation had. I think that's why I feel many people felt, that the implementation of a plan that actually saw things through to completion was a welcome change for the ROPR, and what the ROPR sort of systems (overlapping dialogue; inaudible).

[00:41:52]

T. A. Rosolowski, PhD

[00:41:52]

Well, that's kind of the classic problem with leadership: oh, it's top down, it's just an activity for leadership to say they're doing something, but nothing's ever going to happen on the ground. [00:42:01]

David Tweardy, MD

[00:41:59]

That's right. And that's the disconnect that was in existence when the pyramid strategic plan moved forward. I have to say that's what I saw --it happened with it, except for one clear exception of very useful work product. It just seemed to wither on the vine, never seemed to kind of come to full fruition. And necessitated what actually turns out to be two additional strategic plans, if you—that was the one that happened before I came. Ron initiated a strategic planning effort about a year after I got here that also kind of didn't have much in the way of sustainability, or was not sustained. And then the third was the McChrystal-initiated strategic plan, which I think of more as operational than truly strategic, but very important. I think that is, in my view, the first strategic ... The pyramid might have been successful. I don't know that I would say it was hugely successful. It certainly had some useful work products from it, like, as I mentioned, the Community of Chairs suggestion, and the reevaluation of the role of the chair. I think the Ron DePinho-initiated strategic plan, I don't think that I could say that much useful came out of that. The McChrystal, yes, because of the ROPR, and I'm very optimistic that this next strategic plan will be successful, because I think it's going to—I like the way it's being developed. I like the setting in which it's occurring, meaning where we are as an institution. And I think that the ... I'm really optimistic that it's going to come up with some very important work products that we'll be able to take forward and use to great effect. [00:43:57]

T. A. Rosolowski, PhD

[00:43:57]

And just for the record, I want to say that what you're referring to as the new strategic plan is the process that's based on Lafley-Martin's *Play to Win*. [00:44:06]



Interview Date: April 18, 2019

David Tweardy, MD

[00:44:06]

That's correct. That's correct.

[00:44:08]

T. A. Rosolowski, PhD

[00:44:08]

Yeah, just to contextualize. Yeah, I mean, that's ... I also just really want to observe that I can tell that your intrigue with these sorts of processes fits very well with the kind of flow chart brain you bring to molecular processes and—(laughs)

[00:44:28]

David Tweardy, MD

[00:44:28]

Yeah, I think that's true. It's that analytical, biochemical (overlapping dialogue; inaudible)—[00:44:32]

T. A. Rosolowski, PhD

[00:44:32]

Yeah, all of that. You kind of see it. You see it.

[00:44:34]

David Tweardy, MD

[00:44:33]

—pathway. Yeah, yeah, exactly, the pathway orientation.

[00:44:37]

T. A. Rosolowski, PhD

[00:44:35]

Stretching forward—

[00:44:36]

David Tweardy, MD

[00:44:37]

Yeah, I agree.

[00:44:38]

T. A. Rosolowski, PhD

[00:44:37]

Well, it's transferring your abilities from one area to another.



Interview Date: April 18, 2019

[00:44:41]

David Tweardy, MD

[00:44:41]

Yeah. Well, if it works in one setting it might work in another one. It doesn't always work that way, but I think so far I've been (overlapping dialogue; inaudible)—
[00:44:46]

T. A. Rosolowski, PhD

[00:44:46]

Yeah, but you use the tools you got, right? (laughter)

[00:44:48]

David Tweardy, MD

[00:44:48]

Exactly, that's right. Why invent a new tool if the old tool will work?

[00:44:52]



Interview Date: April 18, 2019

Chapter 12

From Marshall Hicks, MD as Interim President to Peter Pisters, MD A: Overview;

Codes

C: Leadership; D: On Leadership;

B: Working Environment;

B: Building/Transforming the Institution;

B: Growth and/or Change;

B: Obstacles, Challenges;

B: Institutional Politics;

B: Controversy;

B: MD Anderson Culture;

C: Portraits:

T. A. Rosolowski, PhD

[00:44:54]

Well, I wanted to ask as we're going through this re-stabilization process, so the McChrystal Group was obviously a watershed moment, and then they backed away, and it was up to the people on the ground to put it into place. So tell me a little bit about your observations. We have Marshall Hicks [oral history interview] in place, and then he is preparing the way, if you will, for Dr. Peter Pisters. So tell me about that movement, from under Marshall to Dr. Pisters. [00:45:25]

David Tweardy, MD

[00:45:27]

Well, I think that Marshall ... Yeah, I think the institution was very ready for a servant leader. I mean, after the leadership that it had had—and certainly John Mendelsohn [oral history interview] and Ron DePinho [oral history interview] were incredibly effective in their own ways, but I would say that they were built in the mold of a more traditional leadership figure, in the history of leadership in the world, in a way, and certainly in academics. I think that Marshall came in very clearly as the servant leader. He wanted to maintain the stability. He wanted to move things forward in a way that was supportive of existing structure, not create anything terribly new, but he did want to move the institution forward, and that's why I think he moved forward with the McChrystal engagement. I think that was an important effort on his part to not stagnate. And so by virtue of being more process-oriented, it was perfectly suited to his time in the institution as the president, because it's virtually impossible to do strategic planning if you're an interim. So I think doing process improvement in terms of how we operationalize things was



Interview Date: April 18, 2019

a stroke of genius on his part. And then, of course, Peter came in clearly in the mold of a servant leader, but it was clear that it became ... He spent a good bit of time just observing and seeing what was going on in this very, somewhat fast-moving organization, frankly, given all that had happened in the two to three years before he came to take on as president. And I think he has established a vision that is focused on different—not necessarily different, but emphasizes different aspects of what he wanted to see and, actually, the faculty wanted to see in the organization: a higher premium placed on professionalism; a higher effort being put on mentoring, on mentoring throughout the organization but certainly mentoring for leadership development; a higher level of attention placed on safety; and—and I think a higher, or a real focus—and it's more—or an increased focus on the future of healthcare, and MD Anderson's role in healthcare in the region, and in the country and in the world. And I would say, in one respect, in some respects, he's placing the focus more on local and regional role, because as the finances of the institution and the stability of the financial underpinnings of the organization become increasingly in focus, because it's just where healthcare economics has been moving. I think that he realized, and I would agree with him, is that we need to make certain we're really successful in our local environment in this region. And I think that we had assumed that that would always be the case. Now I think he was saying, well, we can assume nothing anymore, and let's really make sure we do what we need to do, and more in the future do what we need to do to win the local market.

[00:49:19]

T. A. Rosolowski, PhD

[00:49:20]

It's interesting, because, as I'm thinking back over the range of interviews I've done since 2011, in the first interviews I was doing ... [responding to sound] That may have been transitioning to a different drive. But I was thinking about the early interviews I had done with long-term faculty. And over and over they would talk about the importance of MD Anderson as a Texas institution, and they would stress relationships with the Texas community, a sense of mission to the populace of Texas. And then, when Dr. DePinho arrived, and I was interviewing newer folks, that dropped out. There was less of a sense that MD Anderson is situated in a particular region. And now it's as if Dr. Pisters has brought that back to the conversation, but in a different tone, with more market—I mean, as well, also, commitment to serve the local population in a sense of mission, but recognizing that doing that has a financial advantage. [00:50:25]

David Tweardy, MD

[00:50:25]

Yeah. And that makes perfect sense to me, because I think the particularly new faculty ... I mean, during DePinho's role, stay as the President, his service as President, I think he was trying to look out, or encourage faculty to look beyond the borders of Houston and Texas to a more national and international sort of reach. And it's probably just—it's kind of like playing chords



Interview Date: April 18, 2019

on a piano, what note you're going to emphasize. I think the emphasis now is more on the local/regional, because of the concern that if we do not win in our local market, we will put ourselves as an institution at risk for not being financially secure and successful, and have a margin to accomplish the rest of our mission.

[00:51:35]

T. A. Rosolowski, PhD

[00:51:35]

Absolutely, yeah. Yeah, interesting. Are there other dimensions of that transition to Dr. Pisters that come to your mind? Sort of big themes that are ongoing?

[00:51:49]

David Tweardy, MD

[00:51:50]

Well, I think one of the things that—the challenges or opportunities he had, and I would say it was more of a challenge—is when he came in as the president, and Ron stepped down as president and had less of a day-to-day role in running the institution, there was a bit of a vacuum created in terms of the research community. I think that Ron, one of his clear charges as manifested in Moon Shots, as manifested in creating superstar faculty, was to really improve the reputation of MD Anderson in the research area, both locally and nationally and internationally. And I think he succeeded in doing that. I think when you take somebody whose visual focus, one of his visual—and visible, I should say, not visual—but one of his visible missions, high profile, was to do that. You remove him from the position of President, the question was: who is going to be the champion of research in the institution? And I think that that—that wasn't answered until Giulio Draetta was assigned or was appointed and accepted the position of the permanent Chief Scientific Officer. So we're talking about a year, almost a full year of a little bit of uncertainty in what was the vision of Dr. Pisters in this area of research. It was very clear ... And, of course, by contrast, Ron's vision was very clear, very regularly articulated and implemented. And so when Ron left, people in the research community, particularly in my division and elsewhere, were waiting to hear what's the future of research and his vision for the future of research here. And I think that was something that has now transitioned effectively. I think it would be very important to see who is chosen as the Chief Technology and Digital Officer, too, because there's Given the fact that those roles are distinct and unique, almost, for an academic institution, it'll be very interesting to see what that second role, the Chief Technology and Digital Officer, what the full scope of that position will be, and the person who takes on that position. Because while Dr. Draetta's position as CSO secured certain uncertainties, there's still—I mean, CSO is new. It's a new position to this organization, not the Provost, and it's not a dean-like position, so it'll be interesting. But I went in that direction because I think that was the one thing that—or the thing that people are waiting for, to happen. And I think that researchers in our division in the institution are getting some answers to that, but



Interview Date: April 18, 2019

I still think that's still a little bit of an open question is what's Dr. Pisters' vision for research at this point. And the strategic plan will, I think, help to answer that. [00:55:23]

T. A. Rosolowski, PhD

[00:55:24]

Now, let me ask you another kind of question. This transition process has taken a long time. People are impatient, or they're—"suspicion" is the wrong word, but they're 'observing with sometimes a jaded eye' is maybe a better way to say it. And this is more requesting your observations about Dr. Pisters' style. Some people have said, "Hmm, is this a person who likes process more than decision making?" What's your observation on that, in terms of a style? Is your assessment that this deliberateness is appropriate to the situation, or valuable? How would you evaluate that?

[00:56:09]

David Tweardy, MD

[00:56:09]

Yeah. I think that it certainly was appropriate for him to come in and really understand what had happened to the institution since he left, he went to Toronto. I think that his—I think he is very thoughtful and very—"deliberate" is certainly a good word. Personally, I think that he's not the type of person who'll get ahead of anything here, in terms of get ahead of the preparation and planning. He really likes the groundwork to be laid in seeing how he's operating. He really is very effective, and decides to move when there's a good preparation on the ground floor, and the likelihood of ... And he gets buy-in from lots of people, so the time an initiative comes forward out of his office, it's not any great surprise, it seems, to anybody. I think that's a very effective way to lead this institution at this moment in time. So I applaud his thoughtfulness, his deliberateness. I think it's perfectly suited for the institution he came into, and where it was in terms of its history, and where people were in terms of their morale, their thinking about how they wanted to move forward. I think it was really well suited, a good match. [00:57:51]

T. A. Rosolowski, PhD

[00:57:52]

Well, this is more of an abstract question, because a number of people have said that MD Anderson has always been fortunate to have the leader that it needed in a particular historical moment. For the first three presidents, that meant very long tenures. Ron DePinho really broke that mold. Arguably, he was the person needed at that moment, too, to move the bar in terms of research. And I guess my question is: it's unusual for organizations to have presidents with such long tenures. It's more normal, and more in a corporate world, to have short ones. Do you think that MD Anderson, as an institution, is going into the phase of having shorter-term individuals? Is healthcare changing fast enough that that's needed, or—?



Making Cancer History*
Interview Session: 03
Interview Date: April 18, 2019

[00:58:39]

David Tweardy, MD

[00:58:38]

Yeah. That's a good question, actually. The thing that tends to lead to short tenures in other academic medical centers ... For instance, the average lifespan of a chair of medicine is something like three to four years, and so five years is actually a good period of time. I think part of the reason that chairs step down after three to five years, though, is it just, I think, becomes very exhausting. I think you kind of tend to max out your level of frustration tolerance. And that's, frankly, in most places. I think MD Anderson is a little different. One of the reasons I was as pleased to come to be the Division Head here as opposed to chair of medicine anywhere else is that many of the sources of frustration elsewhere for chairmen of medicine—basically having to often say no—many more times than you say yes, is not quite the situation here. It's almost the case, most of the time, that if you have a good idea that's aligned with the mission of the institution you can move forward in getting it done. That's not the case at most places anymore, because their resources don't allow for that. And so I would say that I would not be surprised if the division heads—and it's like the chairs here, too-- they stay on for a long time. Now, moving it up to the president level, I could see that we may be back in a situation where Peter ... He's a young man, and he's setting the stage for a long tenure. I mean, the way I see it. The other thing he's very attuned to is management of risk, and identifying risk, and making certain that the steps are needed that you can avoid that risk. And I think that's—so in my mind, this is a person who is looking at the long game in his thinking. And, again, because of where MD Anderson is now—and it could change overnight, but there is no institution, frankly, that I know of that can look—in which I would feel as confident that leadership can continue to be successful and maintain, a person like Peter could maintain his leadership role here for the foreseeable future. I just don't. There are other places that that's the case, but there, in those other instances that I can think of, it's because if that person stepped down it's unclear who would step in. I think if Dr. Pisters decided he was going to step down after accomplishing what he hoped to accomplish here, the number of people who would want to step into his position would be large in the pool of people who could be in the position of president of this organization.

[01:02:28]

And so in a very simple way, it's almost like saying leadership at MD Anderson is a plum job. Why would you ever leave it. Versus leadership anywhere else is really hard work, and at some point you're just going to want to bail. (laughter) And so that's my assessment, is that MD Anderson is one of those organizations that I think if you're doing a good job—and it's just not—I don't think it's quite as mind-numbingly difficult to do a good job here. Because, again, you just have the abilities. You have the resources, you have the personnel, you have an alignment of mission and vision, and you have just incredibly engaged people. It's just an easier place to say, hey, I'm going to be here forever. (laughs) And I think Peter might be that way.



Interview Date: April 18, 2019

That's an interesting question, because you almost like to know what is his real thinking. But my prediction is he'll be here for ten years. I could see that with him, and it would not surprise me one bit.

[01:03:36]

T. A. Rosolowski, PhD

[01:03:36]

Okay, well, maybe after the session's over money will change hands, or we'll take some bets, how's that? (laughter)

[01:03:42]

David Tweardy, MD

[01:03:42]

All right. Okay. Yeah, yeah, you let me know what you think.

[01:03:45]

T. A. Rosolowski, PhD

[01:03:45]

Hey now!

[01:03:46]

David Tweardy, MD

[01:03:46]

After you talk with him you may have some insider information.

[01:03:48]

T. A. Rosolowski, PhD

[01:03:48]

There we go! Well, for the record, that comment has to do with the fact that Dr. Pisters has agreed to be interviewed, so we'll see how effective we are at getting good things on the schedule for him, so—

[01:03:59]

David Tweardy, MD

[01:03:58]

Come back to me. (laughs)

[01:03:59]



Interview Date: April 18, 2019

Chapter 13

Emergency Medicine and the Hospitalist Service B: Building the Institution;

Codes

C: Leadership; D: On Leadership;

B: Working Environment;

B: Building/Transforming the Institution;

B: Growth and/or Change;

B: Obstacles, Challenges;

B: Institutional Politics;

A: Definitions, Explanations, Translations;

A: Overview;

B: Survivors, Survivorship; C: Patients, Treatment, Survivors;

C: Cancer and Disease;

B: MD Anderson Culture:

D: The History of Health Care, Patient Care;

D: Understanding Cancer, the History of Science, Cancer Research;

T. A. Rosolowski, PhD

[01:03:59]

Absolutely. Well, before we turned the recorder on you said that a lot of what had been set in place during this transition period created a framework in which you, within the division, could move ahead with certain projects, so maybe you want to talk about some of those. [01:04:16]

David Tweardy, MD

[01:04:16]

Yeah. I mean, I was very fortunate to inherit a division, as I already told you, that had great leadership, and that's at the department chair level, super-section level. And that is a testament and a shout-out, really, to my predecessor, Dr. Bob Gagel. He left the division in great shape. But clearly healthcare is dynamic, and the one thing about medical care at MD Anderson that is, in a way, different, or less than optimum, is the management of acutely ill patients --and both in the outpatient setting, frankly, and in the inpatient setting. As an intensivist—as infectious disease physicians are generally intensivists, particularly me-- I did a bit of outpatient medicine, but all of my medical care is really delivered in the inpatient setting. So I'm used to patients being very sick, needing care literally within minutes, if not hours, of their arrival at the hospital, in order to have the best outcomes. So I'm very attuned to the type of conditions that lead to patients need to come into the hospital, which is acute deteriorations in their health. I think that



Interview Date: April 18, 2019

we were not at the highest level or standard of care in certain aspects of how we managed those acutely ill patients. So I essentially wanted to make certain we moved in the direction of being the best place, not only to get your cancer care but also to get your onco-medicine care in all sort of—across the full spectrum of that, be it optimization of your medical condition before you have surgery, radiation therapy, or chemotherapy, managing those complications during therapeutic period, managing the patient beyond that, and managing complications that are immediate, intermediate, in terms of timing, and then long-term around those cancer care procedures and interventions that happen. One of the things that happens very commonly in the acute phase is those patients decompensate and need to be managed in the inpatient setting. Many times they have complications that are not as familiar to oncologists, to surgeons, or the radiation therapists, as they are to internists, particularly internists who basically specialize in hospital-based medicine, and they're called hospitalists.

[01:07:22]

So the two major initiatives that I wanted to support here—and they had already started—one was the building of a hospitalist service in the Division of Internal Medicine that basically specialized in onco hospital medicine; that is, the care of the cancer patient when they're in the hospital. And the second was further grow the emergency medicine effort to really become as effective as it could be, and supported by the institution, and recognized, because the one thing that the Emergency Medicine Department was started ... So I'll maybe start with the Emergency Medicine Department and then go to the hospitalists, in that order, because in a way it's a natural thing to talk about in that way because patients come in. They actually—50% of the patients that get admitted to this hospital are admitted through the Emergency Center, and so that's a good place to start. One of the things that's interesting around MD Anderson is people filter much of their thinking around how does our competition do X? That's often very helpful, but in the case of Emergency Medicine care it was a distorting factor, because when they—people who knew or trained there at Memorial Sloan Kettering, they don't have an emergency center. And so some faculty, and not a small number here, will always wonder, why do we have an Emergency Medicine Center? Memorial Sloan Kettering doesn't. Well, (laughs) the thing they fail to mention, or don't know, is right across the street is the Emergency Center for Cornell. And so if you're really sick, you go to Cornell's Emergency Center. If you're maybe urgent-care level sick, you'd come into the Urgent Care Center at Memorial Sloan Kettering. And the nearest emergency center here, maybe Ben Taub, might be Houston Methodist. Do you want to send your patients to those two hospitals instead of having a full-scaled developed emergency center? So you can (overlapping dialogue; inaudible). [01:09:50]

T. A. Rosolowski, PhD

[01:09:50]

Does Cornell have the capabilities to deal very effectively with cancer patients? [01:09:55]



Making Cancer History* Interview Session: 03 Interview Date: April 18, 2019

David Tweardy, MD

[01:09:55]

They are not as good as we are. So, in fact, they are sub—in my mind, they're sub—if I were a cancer patient in emergency problem, I'd come to our Emergency Center over Cornell's Emergency Center, or Memorial Sloan Kettering's Urgent Care Center.

[01:10:14]

T. A. Rosolowski, PhD

[01:10:14]

So tell me about the process of setting this all up.

[01:10:18]

David Tweardy, MD

[01:10:18]

Well, again, I was fortunate that that had started before I came here, but I needed to help ... The first was Knox Todd, who was the chairman of the department, and who oversaw the Emergency Center, and then it was Kumar Alagapan, who's the current chair. He came into the system within a year of my arrival as the permanent chair, as it turns out, because Knox decided to retire pretty much within the first year that I came. But what I needed to do is support their efforts to make this emergency room and the staffing be the best it could be. So part of my mission was to sell what they did to the rest of my colleagues in the division head level, often, and elsewhere. And to basically allow the Emergency Medicine Department to evolve as emergency centers elsewhere had evolved almost a decade before, which is ... One of the things about medicine that has transpired over the 50 or 60 years that I've been either in medical school or training is something you are very well aware of, which is the increasing specialization of medicine. Well, emergency medicine became its own specialty in the '60s, '70s, really, in the '70s, when a very straightforward phenomenon, that you're going to understand, happened, which is back in the '50s, '60s, if you were sick, acutely sick, you went to your GP. Then the GP realized I really don't have the capabilities to manage your case, so we'll then divert the patient to the hospital and see them in the hospital. Well, it turns out emergency medicine became the place you went when you knew, or your doctor, --when you called your doctor and say, "Hey, I got this, this, and this," and he said, "Don't come see me in my clinic; go to the emergency center, or to the hospital." Well, the hospital then needed a place to manage patients in the outpatient setting. Some of them would go home, but some of them would be really sick and need immediate intervention; otherwise, they wouldn't do well. And that's what the birth of the emergency center was. Then it was hospital-based, because all of the other resources you needed to manage a patient that was acutely ill were there in the hospital, not in the GP's office, so—



Interview Date: April 18, 2019

[01:12:50]

And then the specialty grew from that, and it grew out of general internal medicine, or surgery. And it's interesting: some hospitals or trauma centers, like University of Maryland, Ben Taub, those hospitals would have surgery run their emergency centers. Yeah. But most other places would have internal medicine run their emergency centers. And then—

[01:13:15]

T. A. Rosolowski, PhD

[01:13:15]

I was going to say, surgery would seem like an interesting lens to put everybody through.

[01:13:21]

David Tweardy, MD

[01:13:20]

Well, and it was the trauma part. If a good fraction of the sickest patients needed lines, needed surgical—you needed to be stabilized in the EC, then rushed to the ER to have all their wounds sewn up, etc., then surgery made sense. So Ben Taub was a perfect example. University of Pittsburgh Medical Center, where I started, was medicine. But then they became their own subspecialty, and then ECs were no longer within the parent department of either Medicine or Surgery, but their own department of Emergency Medicine, and so that was what was created here. And, again, it took our ... But it occurred here in 2012, whereas it occurred in the rest of the world, or certainly the rest of the United States, back in 1990. So we were about 20 years behind the curve in providing the best in acute care to the sickest patients in this hospital. [01:14:25]

T. A. Rosolowski, PhD

[01:14:25]

What was the resistance, do you think?

[01:14:26]

David Tweardy, MD

[01:14:27]

It was kind of just—I think it was—it was somewhat—emerged from that Memorial Sloan Kettering memory that many people had. It emerged from a sense that, well, if we're truly an emergency center then we'll have to take patients that don't have cancer. That turned out to be a very small problem. The Memorial Sloan Kettering issue became really a moot point once you realize the EC for those cancer patients actually was across the street. That's where they'd go to start before they'd be transferred over to Memorial Sloan Kettering. The other—it was just a lack of information about how medicine was evolving outside of a cancer center, okay. So, think about it: the number one and number two cancer center that are dedicated to cancer, one of them doesn't still have an emergency center and the other took a long time to develop it. So it was



Interview Date: April 18, 2019

kind of just this concept: cancer patients, they don't have emergencies. But then you tell, oh, by the way, 50% of patients admitted to this hospital come through the EC. So a lot of it was just lack of knowledge, so lack of knowledge or misinformation. And so part of my mission in this area was to educate. And then there was the—and then the second phase of inpatient care. So Emergency Center would admit many patients, and then they could admit them to two places, and that second place became available in 2014, which is the CDU.

[01:16:12]

T. A. Rosolowski, PhD

[01:16:12] The CDU? [01:16:14]

David Tweardy, MD

[01:16:14]

The CDU, the Clinical—this is a real terrible abbreviation—Clinical Decision Unit.

[01:16:19]

T. A. Rosolowski, PhD

[01:16:19] Oh, dear. [01:16:20]

David Tweardy, MD

[01:16:20]

I know. They're often called observation wards elsewhere, where you can bring a patient in, observe them up to 48 hours, and then make a decision whether they need to be admitted or could go home, delay it for 48 hours. A lot of patients come in, need stabilization, need a few interventions, but they don't need a full hospital admission. And, actually, the CMS encoding changed for that particular type of admission, that short admission. And so we ... When that became separately billed and based on, really, a need—you could just have made them short admissions, but there was a billing difference between the short, 48-hour, less-than-48-hour admission, and an admission for 50 hours. There actually is a difference. And so our institution—that is, MD Anderson—decided, okay, let's do what, again, the rest of the country had done probably five years before: create an observation unit, call it a CDU, but—(laughs) and this is really right after I got here—but do the very strange thing of having the physicians of record of those patients admitted be the last MD Anderson doctor that saw the patient. So, radiation therapy patient comes in, had lung cancer, radiated, now comes in with post-obstructive pneumonia. Okay, Dr. Herman, you're the physician of record. You saw the patient six months ago. You gave the patient radiation. Dr. Herman: "Wait a minute, I'm in Europe at a radiation oncology conference. How can I be the physician of record? (laughs) I can't see the patient in



Interview Date: April 18, 2019

the obligatory eight hours that I'm supposed to be doing." So, crazy idea. So what happened over the next four years is that I, with the help of Kumar and the wisdom of the organization, we changed the ownership of the patient, and we changed the oversight of that unit to the Emergency Center.

[01:18:28]

T. A. Rosolowski, PhD

[01:18:28]

Interesting, yeah. Oh, yeah.

[01:18:29]

David Tweardy, MD

[01:18:29]

So that continuum, if you're in the emergency room, can't decide whether you can go home, we're going to watch you, rather than leave you in the emergency room for eight to 12, whatever hours, we're going to bring you into the CDU and then take care of your problem and have time to evaluate whether you really need to be admission longer than 48. So one of the major accomplishments I think I had made is I changed the structure of the CDU with the leadership of Kumar, and that makes certain that patients actually get seen in a timely manner. The most important patients to see within hours of their arrival are the patients coming into the EC, or who have to be observed into the CDU. And it was interesting: that concept wasn't integrated into the thinking and the DNA of this institution. So that's one of the things that I helped to develop, that thinking about how do you do the best of acute care in the real world, and bring the best practices of the world into this cancer center, which is so well-renowned for everything else it does.

[01:19:40]

T. A. Rosolowski, PhD

[01:19:41]

It's really, obviously, a really important story in terms of a significant piece that's been added to patient care here, but it is also, at a different level, just this interesting observation about how the culture of an institution can become really ossified and resistant—
[01:19:59]

David Tweardy, MD

[01:19:59] Oh, yes. Yep, yep. [01:20:00]



Making Cancer History* Interview Session: 03 Interview Date: April 18, 2019

T. A. Rosolowski, PhD

[01:20:00]

—and how hard it is to change people's perspectives and paradigms.

[01:20:04]

David Tweardy, MD

[01:20:03]

Yeah. And the leadership here had ... One of the ways you do that is you bring somebody in who hasn't lived, breathed, and eaten everything here at MD Anderson in their careers, and just knows what acute care medicine is like, and how it's evolved over the time, and bring that person in to be an agent of change. And Kumar, by the way, fits that description perfectly well, as well. He was head of Emergency Medicine and the CDU at North Shore—or at Long Island Jewish for ten years before Knox recruited him. Actually, he went to Ben Taub and then Knox recruited him here to join the faculty, and within a month he became the interim chair of the department. And, again, this is that outside thinking about how emergency medicine and observation care is provided. So that was, I think, one of my and Kumar's—totally to Kumar's credit—changes that I implemented with his leadership that I think was impactful in a major way, and I think will have impact for the rest of the history of the organization. The other is once you do come in for a true admission, who should care for you? Should it be the oncologist who last did internal medicine training 20 years ago, or 15 years ago, even five years ago? Or should it be people who did their training and really care for inpatients as what they do for a living? And the answer, frankly, is the latter. And so when I first came here there were two models of hospital care—actually three, and two of those models still exist, but one of them is actually have the team that's caring for that patient for the cancer also care for them while they're in the hospital. That model still exists for surgery, and still exists for some departments in cancer medicine. But what we have argued successfully, and shown that we can deliver, is basically say, no, when the patient's in the outpatient setting and getting their chemotherapy or radiation therapy, or needs their surgery—and surgery still stays with their own model, but then they get to chemotherapy and radiation therapy, you are the experts. You're the experts at radiation therapy. You're the experts at chemotherapy. But when they need a doctor, a physician, you're not the experts. The experts are in internal medicine. You need an internist to manage you. And not just an internist: you need a hospitalist, an expert in the inpatient management of medical problems for patients.

[01:22:48]

And so when I came here we had six hospitalists, and they were competing with in-department hospitalists: Cancer Medicine departments like Leukemia, GU-Medical oncology, and even, I think, Stem Cell. They had, particularly Leukemia, two docs who their job was to care for the patients in the house, as their primary hospitalist, if you will. The retention and burnout there was phenomenal. Those people didn't last very long. In GU Medical Oncology, similar. And so when I came, I said, "Let's blow up and expand our hospitals group. I think we'll be able to



Interview Date: April 18, 2019

convince the cancer medicine physicians that it's a better way to proceed." Because hospitalists, especially now with, in General Internal Medicine. In fact, there is even a sub-subspecialty of hospitalists called onco-hospitalists. These are hospitalists that care for the medical care of acutely-ill inpatient who has cancer, and that's really what we do in our division. And now we've grown up to be 21 hospitalists in the last four years. We actually are the largest inpatient service now in the hospital, in the aggregate. And I don't say that because, a-ha, we did it. It's just, actually, if you want to have those patients managed optimally --bring them in, get them cared for, and discharge them so you can have the bed available for the next sick patient-- you want your hospitalists to manage them, because they know how to do it. They can get the patient in, get them diagnosed, get them managed, get them out of the hospital in the most timely fashion. They don't have any other clinical responsibilities, like your oncologist did, who's also doing clinic, or ... And they don't have to look in the book of how do you manage hyperkalemia, community-acquired pneumonia, or hospital-acquired pneumonia, or hyper—etc., etc.

[01:24:56]

So the good news here, I think, the reason we've been able to grow, it's really in the wisdom of the institution to sort of say, okay, if you have three models of care, having them be provided by the service that takes care of them through their outpatient service, as well as inpatient, or embedded hospital types who are in their cancer medicine, or a group of dedicated oncohospitalists ... The institution has really said, yeah, I think Tweardy's right: let's go with the embedded—let's go with the hospitalist group that's specializing in onco-hospital medicine. We'll be able to achieve a whole lot of other key indicators of care with that group than disparately trying to do it in implementing it across the heterogeneity of the other types of models that we had or that were in existence. So, in my mind, this is the other perhaps, longlasting and impactful intervention or development, I think, that I was able to grow. I didn't create it; I just grew it, and convinced the institution—and it wasn't hard. And a fortunate thing about having Steve Hahn as the COO is he came from Penn, and he understood how you do this in other places, and that this was the better model to pursue. And, of course, we have a great inter—we have a super-section Chief, Josiah Halm, H-A-L-M, who is just—led that supersection since it was six faculty. And Carmen Escalante [oral history interview], his Chair, who has really been amazingly interested and completely aligned—in fact, I should say I aligned with her vision, but we aligned brilliantly in terms of trying to have this happen within our division. [01:26:49]

T. A. Rosolowski, PhD

[01:26:54]

Interesting. Yeah, the value of the fresh face, the new perspective, new way of communicating, and there's also this thing about how you're never a hero in your own land—
[01:27:08]



Interview Date: April 18, 2019

David Tweardy, MD

[01:27:08] That's right. [01:27:09]

T. A. Rosolowski, PhD

[01:27:09]

—and so you can come in as a different hero, (laughs) to champion something. [01:27:12]

David Tweardy, MD

[01:27:12]

That's right. Nobody's a prophet in their own land. That's exactly right. [01:27:16]

T. A. Rosolowski, PhD

[01:27:15]

Right, that's it, that's it, the prophet in your own land, yeah.

[01:27:17]

David Tweardy, MD

[01:27:17]

Yeah, and I—well, in a way it's interesting. Here, the one thing that I did encounter was the sense that you've been just here, what do you know? Kind of: I've been here 20 years; I know how this place works. So it cuts both ways, in some respects. I think certain folks here are really interested in how it's done elsewhere, and how to bring in best practices, but there is a segment of the institution that doesn't want to change, and is very happy with the way things are, and thank you very much for your suggestion but we'll continue doing things the way we have. It's worked so far.

[01:27:58]

T. A. Rosolowski, PhD

[01:27:58]

Yeah, it's interesting. I mean, I'm working on a project right now with Charles Balch on the history of Surgery, and what's coming out of those stories is a parallel story in the early years of traditions of surgery based on the Sloan Kettering model, and then how kind of some isolation in the institution from other institutions created a track that was not aligned with best practices that were evolving elsewhere, and so it really did take a new person, new recruits—[01:28:27]



Interview Date: April 18, 2019

David Tweardy, MD

[01:28:26] A new face to come, yeah. [01:28:27]

T. A. Rosolowski, PhD

[01:28:27]

—to come in and change that.

[01:28:29]

David Tweardy, MD

[01:28:29]

Well, and I would say the second piece is almost as important, if not more important, is that the new vision, but then the ability to recruit and dilute. Recruit and dilute. [01:28:40]



Interview Date: April 18, 2019

Chapter 14

Final Comments and What Might Be Next

A: Overview;

Codes

C: Leadership; D: On Leadership;

A: Professional Path;

A: Personal Background;

B: Building/Transforming the Institution;

B: Growth and/or Change;

A: Overview;

T. A. Rosolowski, PhD

[01:28:40]

Recruit and dilute. (laughs) Yeah, that's very true. Yeah. Well, we've got about 15 minutes left, and I wanted to ask you if there was anything that we'd missed, things that you want to say for the record at this particular moment in time. Now's your chance. (laughter) [01:28:58]

David Tweardy, MD

[01:28:58]

Well, no, I have things I want to say off the record. (laughter)

[01:29:01]

T. A. Rosolowski, PhD

[01:29:02]

Well, we can do that, too.

[01:29:03]

David Tweardy, MD

[01:29:03]

No. Yeah, I think that this has been a fun exercise, because it allowed me to kind of go back and think about how I became the person I am, the physician I am, the leader I am, and also how the institution impacted me, and how I'd like to think I had a positive impact on the institution. [01:29:23]



Interview Date: April 18, 2019

T. A. Rosolowski, PhD

[01:29:25]

Well, maybe I have another question, which is: what do you want to do next? Because you're here, and why leave MD Anderson, as you said earlier, so you're not going to sit in your office eating bonbons. (laughs)

[01:29:38]

David Tweardy, MD

[01:29:38]

No, no. In fact, that's the interesting—that's a very good question, actually, because one of the things that an academic medical career prepares you for is always looking for the next chance, always looking. Then that's a kind of colloquial way of saying looking for the next opportunity, because inherent in the academic career track is progression, right? You start out as an instructor or assistant professor. You move up to full professor, and then if you are interested in having a broader impact then your immediate environment, be it a lab—then you're interested in leading, a leadership/administrative type position so you can mentor others outside of your scope of immediate interest, and take on leadership responsibilities. One of the things that I used to jokingly tell people when I was in Pittsburgh was I'm always looking for my next job, and part of that is because I was at the beginning of that process, and opportunities could be at Pittsburgh, but maybe not. Maybe a better opportunity would be elsewhere. In fact, when I left Pittsburgh after 12 years, I moved through the ranks and I was about to move up to a full professor, but I came to Baylor to become Chief of ID, and I was promoted to-my first appointment as professor was at Baylor in 1999. That was—keeping my eyes open for that opportunity was really an incredibly important thing to have done, because it got me here in Houston. And, of course, while I was at Baylor as the Chief of ID, around even as early as two years into that position, people would send me opportunities to be chair of medicine, and I was—so I would and I think I may have told you this, but if I didn't, one of the things that has a moderately high predictor of future chairs of medicine is if you're a chief medical resident. And it's sort of especially if you're working with a really good chair, and I happened to have a phenomenal Chair of Medicine when I was the Chief Medical Resident at Case Western, and I think he—I got the bug then. And so after establishing that I could do the job of Chief of ID, I began to look for a Chair of Medicines position. And so the opportunity to come here was just perfectly timed, and also, as I say, because the nature of this position as Division Head, it's just—it was and is still a phenomenal opportunity in the leadership at this level. And, by the way, I continued to get heads-ups and alerted to other leadership positions across the country, and none of them have attracted me at this point in time.

[01:32:47]

I can tell you with pretty much certainty I am not going anywhere in the foreseeable future. I've been here four years. We had a retreat, actually, because both Bill and I, Bill Atkinson and myself, were in this position in our fifth year now, and we thought a retreat at five years would



Interview Date: April 18, 2019

be a good time to kind of recalibrate, reset, and recreate a vision, if you will, for our division. And we did it just in—kind of just timed it in anticipation of the institution's strategic plan. So it was well-timed, since we'll be, I think—at least understand ... Bill and I will have an understanding of where we want the Division to go forward, and be able to put that in context of the strategic plan for the institution, I think more effectively maybe than we would have otherwise. But so at this point—I don't know that I'm anxious to go anywhere at this point. And, as you probably can imagine, the opportunities are like deanships, medical directors of larger institutions, presidents. I mean, MD Anderson President, or being a president of an organization like MD Anderson, those are rare, rare kinds of positions. So I'm not not looking at emails, but I'm not anxious to leave, yeah, at this point. I think that this is a—I still have work I really would like, things I'd like to accomplish here, and—
[01:34:32]

T. A. Rosolowski, PhD

[01:34:32]

What might those be?

[01:34:32]

David Tweardy, MD

[01:34:33]

I think I'd like to really make certain that we are well-positioned within the new strategic plan as a division. I'd like to ensure that we don't somehow, through some lack of action or some oversight on my part and Bill's and the rest of the chairs here, we don't take advantage of opportunities that do arise as the strategic plan for the institution is formulated. So I'd like to make certain that we maintain our alignment in the institution, and in the institution's overall strategic plan moving forward. I'd like to see a little bit of—there are certain leadership transitions I'd like to see within the Division, as well. I mean, the leadership we have is outstanding, but one of the things I'd like to see is that we transition leadership in a natural course of events. So I'd like to be in the position, perhaps, to be part of that. I'm intrigued to see how our network moves forward, and what, again, our division's role is going to be in if it will, indeed, expand in the network effort that is growing under Mike Kupferman's oversight and Mike Brown's oversight. I think the network is in the best position it's ever been since I've been here, in terms of transparency and clarity of vision around what it's trying to accomplish. I think that could be further clarified, but it's in a much ... Well, let's just put it this way: it's in a better position than it was, in terms of explaining what it does, what upsides are, how each of the divisions can benefit from it, as well as those divisions could benefit the network to enrich the mission of the institution. So I'd like to continue to participate in the network growth, as well. I think that's a rare opportunity. There's not many institutions that have the ability for outreach in the network like we do, and I find that absolutely—I find it compelling to see and participate in. [01:37:03]



Interview Date: April 18, 2019

T. A. Rosolowski, PhD

[01:37:05]

Is there anything else you'd like to add?

[01:37:06]

David Tweardy, MD

[01:37:06]

No, I think that's good. (laughter)

[01:37:08]

T. A. Rosolowski, PhD

[01:37:10]

Well, this has been a lot of fun.

[01:37:11]

David Tweardy, MD

[01:37:11]

Yes!

[01:37:11]

T. A. Rosolowski, PhD

[01:37:11]

Among many other things.

[01:37:13]

David Tweardy, MD

[01:37:13]

Well, thank you. I have enjoyed it very much, really.

[01:37:15]

T. A. Rosolowski, PhD

[01:37:15]

Good, good, good. Well, I thank you very much for your time.

[01:37:19]

David Tweardy, MD

[01:37:19]

Well, again, my pleasure.

[01:37:20]



Interview Date: April 18, 2019

T. A. Rosolowski, PhD

[01:37:20]

And for your vast range of insights.

[01:37:22]

David Tweardy, MD

[01:37:22]

Well, (laughter) thank you. I hope you feel that way.

[01:37:26]

T. A. Rosolowski, PhD

[01:37:26]

Oh, I do. I mean, we covered a lot of really interesting moments at the institution, and I do think—one of the reasons I thought this would be a great interview, and Marshall Hicks suggested you, and it was exactly what I wanted to do, was to collect the impressions of someone who was a relative newcomer to the institution and bringing that fresh eye, particularly in this period of turbulence. So I thank you for all of that.

[01:37:52]

David Tweardy, MD

[01:37:52]

Well, good. I'm glad I was able to deliver the goods in that area. And I have to say it's just been a remarkable saga, really, and the good news is I think it's going to have a happy ending. I love happy endings! (laughter)

[01:38:07]

T. A. Rosolowski, PhD

[01:38:07]

Well, what a perfect place to end!

[01:38:08]

David Tweardy, MD

[01:38:08]

Yeah, yeah, yeah.

[01:38:10]

T. A. Rosolowski, PhD

[01:38:10]

All right, well, I'm saying for the record that I'm turning off the recorder at five minutes of 3:00. [01:38:15]