HALF A CENTURY AGO, President John F. Kennedy rallied the nation behind the goal of sending men to the moon within a decade. It was a daunting challenge, but “one we are unwilling to postpone, and one which we intend to win,” Kennedy said. "Those words ring just as urgent and compelling for MD Anderson’s Moon Shots Program." Dr. Ronald DePinho, president of MD Anderson Cancer Center, electrified the medical community last year when he announced his goal of eradicating eight of the deadliest cancers within the decade. We’re at a watershed moment, DePinho says, thanks to “a confluence of conceptual maturity and game-changing technologies”: We understand the major instigators of cancer and can design preventive strategies. Advances in imaging and proteomics have made possible much earlier diagnosis. Genetic modeling has produced breakthroughs in treatment. Cognitive computing enables us to leverage the information in a million case files going back 70 years. The bottom line, he says, is that “if we implement everything we know right now, there will be a dramatic reduction in mortality.”

A key part of that is accelerating drug development. “It’s like a relay race today,” DePinho says, where ideas are handed off from researchers to biotech labs to Big Pharma to clinicians running trials. It takes much too long, and 90 percent of the drugs fail—most in late-stage clinical trials, wasting hundreds of millions of dollars. So MD Anderson has created a platform to bring all the stakeholders together from the beginning, replacing that serial workflow with a more efficient parallel process.

The fact is, DePinho adds, we really have no choice but to eliminate these diseases. With the aging of America, a continuation of current morbidity rates will bankrupt the health care system. “Cancers increase exponentially after age 60. If you look at the need and the resources, it’s completely insufficient. Technology and innovation are the only answers.”

The Art and Science of Data Visualization

“LOOK AT THE TITLE of this conference,” Martin Krzywinski says. “Data | Life … That pipe encapsulates the conversation we’ve been having today. How do you get from one to the other”—from numbers to meaning, from science to health? That’s the purpose of data visualization. “It’s a tool for understanding what we already know.”

And we need it now more than ever, with the explosion of information coming at us. It’s been estimated that the body of medical knowledge is doubling every five years. You could put it all in a table or spreadsheet, but you wouldn’t “see” anything. The human brain can’t encompass the full complexity of the world. The process of designing an infographic forces you to select, to highlight certain relationships.

So what makes a good visualization? Obviously, it has to communicate clearly and honestly. You can lie with pictures, just as with statistics, Krzywinski says. He points to the “heat map” used to represent brain scans, where activity levels are indicated by different hues. Certain color transitions, for example, from green to yellow, are more striking than others, and the impact may not be proportional to the actual change.

But a good infographic does more than convey information; it connects with people emotionally and draws them in. The figure is often the first thing a reader will go to on the page. It should be accessible, attractive, dramatic. “You have to bring art to bear,” Krzywinski says. “You want to delight.”

Finally, consider your audience. Scientists love detail; they want to immerse themselves in it and have it explain everything. For a lay reader, less content and more context is called for. And Krzywinski believes that researchers have an extra responsibility in communicating with the public: “The most important thing today,” he says, “is to communicate our passion for science.”