Biotechnology and Healthcare: A New Dawn? With Bob Bradway, CEO of Amgen

Simon Brewer

The late brilliant Steve Jobs said, "I think the biggest innovation of the 21st century will be at the intersection of biology and technology. A new era is beginning." And if you want to see how biotech can change the world of health and also create extraordinary value for investors, you need to look no further than Amgen, one of the world's leading independent biotech companies. Now, looking no further means me here to today in London and my guest in San Diego. But it's not every day we get to talk to the CEO of one of the top 60 most valuable companies in the US, with a market cap of around $130 billion. So today I'm thrilled to welcome Amgen's CEO and chairman, Bob Bradway. Bob, welcome to the Money Maze Podcast.

Robert Bradway

Thank you, Simon. Great to be here with you.

Simon Brewer

Bob, we met at Morgan Stanley a long time ago. You were there for, I think nearly 20 years, and we actually both left the same year. And you were known as the gentleman banker, setting very high standards, and you've had a very impressive second career. And we're going to talk about that in a minute. And I hope, because biotechnology is such an intriguing and complicated area, that today we can talk a little bit about the changing scene for drug discovery, the scale of costs and timelines involved in finding, developing, and gaining approval for new drugs, the role of technology in this process, the big unmet medical opportunities for Amgen and key drivers of your business, and exploring some of those themes within that biologics, genetics where most of us are unschooled, and a sense check on where we

are in some of the world's biggest problems like heart disease and the work you've done on obesity. So, not much to cover then, Bob, that's the good news.

Robert Bradway

Yeah.

Simon Brewer

I have to ask you because we love a little bit of perspective. Growing up, were you born into a medical family?

Robert Bradway

I was. I grew up believing I'd be a physician like my father, who was a surgeon. And for most of my academic career, that's all I had an interest in, was biology and the idea of moving onto medical school and eventually becoming a surgeon and doing what I had dreamed of doing since a young age. But as I got through college and had some great experiences, had a chance to see inside the Life of Medicine program at Harvard and at Johns Hopkins at Ohio State. And yeah, I realized, while it was very interesting, there were other things in the world as well, and I was fortunate to have an opportunity to discover an opportunity at Morgan Stanley to join what was then a nascent group in biotechnology. And the rest is history from there.

Simon Brewer

Huh. So, you got a BSC in biology from Amherst and then later on you get an MBA from Harvard. But I have to ask you, how did you earn your first dollar?

Robert Bradway

Mowing lawns.

Simon Brewer

Okay. And was that in sunny California?

Robert Bradway

No, that was in Ohio. I grew up in Columbus, Ohio, where the lawns are lush, and I learned to cut them and bag them as a young 12, 13 year old.

Simon Brewer

So, let's just talk briefly about that Morgan Stanley experience because investment banking was a relatively new concept and it obviously kept you there for quite a long time. What was the lure?

Robert Bradway

Well, initially it was the opportunity to work at the intersection of science and business. So, I joined Morgan Stanley in 1985, straight out of college with an undergraduate degree in biology and actually deferred medical school to join a program at Morgan Stanley. I was fortunate to be part of a team that was doing exciting things. I joined the firm in 1985, which was the very beginnings of the biotechnology industry. Had an opportunity to work with companies that were doing exciting things, raising capital, combining with other companies. And really I think what kept me in the game there, Simon, for 20 years was the quality of the people and the opportunity of working with great clients.

Simon Brewer

And if one's thinking that somebody has a master plan, they would say, "Well, smart. You join Amgen as the VP in operations, you move up to CFO and then bang, you're CEO in May, 2012." Now, was it really as well thought out as that?

Robert Bradway

No, of course it wasn't, Simon. I was willing to leave a career in investment banking to join Amgen because I believed in what the company was doing. I had a great opportunity to join an area of the company that gave me a chance to learn a whole bunch of completely new things and really throw myself into what is the science and technology of biotechnology. And then as you say, after a year or so of doing that, I became CFO, which was a little bit more familiar territory for me. And then after a few years as CFO became president and chief operating officer and then became CEO and chairman after that.

Simon Brewer

Amgen. Let's talk a little bit about its evolution and then talk about its current shape and size.

Robert Bradway

So, Amgen was founded in 1980 and we were founded really at the dawn of what was a biotechnology revolution. There were hundreds or even thousands of companies started at the same time as Amgen. And I would note Simon, there are really two of us left from that original wave of biotechnology companies that crept up in the landscape in the United States. Only two of us left as independent, thriving biotechnology companies. So, our evolution was one of a couple of very successful breakthrough medicines. Our first medicine changed the practice of nephrology. And we quickly followed that with two other medicines that were equally practice of medicine changing innovations in this case, in the cancer field. The story of Amgen is one of innovation, it's one of first in class medicines making a profound difference for people who were suffering or struggling with really tough disease.

Simon Brewer

And I got to just quote the stats because in June '83 there's an IPO that raises nearly $4 million. 12 years later, in '92, Amgen hits a billion dollars of product sales. So it was absolute liftoff. But let's just maybe recap right now today, where are you in terms of physical locations? I know that you did revenues of 26 billion last year, but just give us a sense of scale and size.

Robert Bradway

Sure. So, Amgen is based in 102 countries around the world. Our headquarters is in southern California. We have research operations really around the world, but the bulk of our activities in research and development area are in San Francisco and southern California, in Boston, Massachusetts, Munich in Germany, Reykjavik in Iceland, and then a number of development facilities in the UK and other major markets around the world as you'd expect, Japan, China, et cetera. We're represented now, as I said, across 102 countries around the world. We have about 27 medicines that are approved and on the market in primarily three therapeutic categories, inflammation, anti-cancer medicines, and then medicines that address cardiovascular disease, bone disease and nephrology, and other areas that we call general medicine.

Simon Brewer

Well, we're going to dive into a few of those, but help me and help others who are not initiated. What is essentially the difference between biotech and pharma?

Robert Bradway

Well, when you think of the tablets and the pills that we take, that's what we associate traditionally with pharmaceuticals. So those are what we call small molecules and they're a whole lot less complex than biologic molecules, or the proteins, that our industry was founded on. So the starting point is simple pharmaceutical chemical synthesis, those are the pills that we take, in contrast to the complex biologic medicines that this industry was founded to develop.

Simon Brewer

And so, if I say, if you were asked to distill your mission today, thinking ahead for the next decade, how would you distill it?

Robert Bradway

Very simple. Our mission is to serve patients suffering from serious disease. We do that by advancing innovative, usually first in class medicines, that are designed to meet a very important major medical need. As I said earlier, we do that in three therapeutic categories, immunology, we do it in cancer, and we do it in general medicine.

Simon Brewer

Now we all read as layman about the testing process, and I read in one of your research documents when it was a discussion on testing with mice, you said that mice, they aren't terribly good at predicting what will happen in humans and that's one reason why it takes 10 plus years and costs two and a half billion dollars to advance a drug from its earliest stages to approval. Is that really true?

Robert Bradway

Well, it is certainly true that it takes 10 to 15 years and in excess of two and a half billion dollars on average to develop a drug. I think the reference to mice is that before we're able to enter human experiments, we have to demonstrate, for regulators around the world, that the medicine that we want to explore in humans has a chance of being effective and also that it's likely to be safe. So we establish that in animal models and very often that means in mice. But the conundrum assignment is that in order for us to enter human clinical experiments, we have to have been successful in an animal model. So we have 100% success in the animal model, we then move it into humans and we find that fewer than one in 10 actually make it through and become approved drugs. And that's because animal models, in particular mice, don't represent very well what actually happens in humans. So, that's what led us to want to think differently about how to develop drugs and led us in particular to want to look at the field of human genetics as a way to increase our odds of success in what is a very challenging, risky, expensive field, which is drug discovery and drug development.

Simon Brewer

Let's just start with the world's big killer. I mean, if I'm right in the research that I read, cardiovascular disease causes a third of the world's deaths. Again, I've got to say to you, did I get that wrong?

Robert Bradway

Well, there's no disease that is responsible for more death and destruction on our planet than cardiovascular disease. So, the morbidity and mortality from cardiovascular disease is far and away the biggest public health challenge that we face as a society today.

Simon Brewer

And just tell me a little bit how Amgen, that's been pretty significant in this space, Amgen's bold ambition is to halve the number of cardiovascular events by 2030. So, just tell us a little bit about how you are hoping to do that?

Robert Bradway

Well, in conjunction with some of the major medical society, we've set ourselves a goal, as you say, to try to halve the number of cardiovascular events in this country by 2030. And Simon, that reflects our conviction that we know what the causes of heart disease in our society today are. A very important contributor to heart disease is that people are wandering around with LDL levels, LDL is the bad cholesterol, LDL levels that are just simply too high.

Robert Bradway

So, the reason we have so many heart attacks and strokes is that we have too many people whose LDL, or bad cholesterol, levels are too high.

Simon Brewer

Got it. Now let's talk about genetics, because, I think again, it'd be fair to say that lots of people have become more aware of the broad, what happened when we started mapping the genomes. But you've got some really interesting work that you've done, and when you mentioned the geographies, of course you mentioned Iceland, which most biotech companies or pharma companies wouldn't. In fact, most

companies period wouldn't have Iceland on their map. Tell us a little bit about how you are approaching genetics.

Robert Bradway

Iceland is a particularly important place in the field of human genetics. The reason it is, Simon, as you know, Iceland is an isolated island in the middle of the North Atlantic. And for hundreds, and even thousands, of years there was very little trafficking of people on and off the island. That created what we call a founder population. And so, the genetics on the island of Iceland made for a very interesting laboratory to try and understand the genetic conditions that predispose people to disease or to a life of good health.That has been the main focus in our human genetics, has occurred on the island of Iceland through a company that we acquired in 2012 called Decode Genetics. And so, the beauty of a founder population like that is that if there are rare variants in an individual's genome or gene profile that gives rise to a serious disease, we're more likely to find them there than we will be able to find them in say, an [inaudible 00:14:36] population like continental Europe or United States. So, it is a prime location for trying to understand genetics and as I said, what causes people to be ill, and what enables people conversely to live long healthy lives. And so, we have expanded now well beyond Iceland so we can compare what we've learned about the genetics of that isolated population with more diverse populations around the world. And through that activity we've established ourselves as the world's leader in using human genetics to try to understand disease and how to develop therapies that can prevent or improve the outcomes for people who are suffering from challenging disorders.

Simon Brewer

Can you give us a sense of how important that might be in the pipeline of drug discovery, is genetics going to be a third of new formulations that you expect to find?

Robert Bradway

Well, what I would say, Simon, is that we do expect it will be very important. And if we look at our pipeline today, something on the order of two thirds of our molecules in our pipeline, outside of cancer,

talk about that separately if you'd like. But outside of cancer, about two thirds of our molecules are ones which we believe are genetically validated. So we're pursuing them because we believe we have genetic evidence to suggest that if we perturb the pathway that we're intercepting with our therapy, we can have a beneficial outcome on the disease process that we're targeting.

Simon Brewer

Behind all of this is the sense, if I translate it into investment speak, is that you as a company are pursuing significantly important unmet medical needs, for which I read, higher risk but significantly higher rewards.

Robert Bradway

It's certainly higher risk when you're trying to innovate and develop first in class medicine. So, when you're developing a first in class medicine, you can't rely on the data that others have generated through time to show that the outcome you're intending to achieve is likely to happen. So, we are plowing new fields. An example of that, Simon, in cardiovascular disease, is a medicine that we're in final stage of development for that lowers something known as LP-little-A. Turns out that LP-little-A is another very important risk factor which gives rise to heart disease through the process known as atherosclerosis. And unfortunately it's a protein which is not affected by other drugs that are available today or by diet and lifestyle changes. So, if you are born with a high level of LP-little-A, you are at high risk of heart attack and stroke. And many people who are born with this high level of this protein have them at a very young age in life. So we are developing what will be a first in class medicine, and as we've talked about before, Simon, that is a process that takes 10 to 15 years, takes on average more than two and a half billion dollars, and you finish the two and a half billion dollars of investment and only then do you turn over the card to see whether you've been successful in preventing cardiovascular events by lowering the parameter that you were trying to lower. And that's the risk in drug discovery when you're trying to be first. Now, the reward obviously is it has the potential to be a therapy which, for the first time in the history of mankind, can make a difference and enable people born with this protein challenge to live a

full, long healthy life without the risk of heart attack or stroke. So, the reward is obviously meaningful if we're successful in advancing a therapy like that.

Simon Brewer

Clear. Now the other silo which appears to be very important for you, and a earlier call helped explain it, is biologics. And I'd love you just to flesh that out so we can understand what it means to you at Amgen.

Robert Bradway

Yeah. Well, when we say biologics, Simon, we're largely referring to medicines that are proteins. Let me contrast what a protein medicine is with, what many of us are familiar with, the pills we take in the morning or the evening. So those pills are small molecules, they're pharmaceutical medicines that are made using the tools available to us in chemical synthesis, for example. So if we just take aspirin. Aspirin is a relatively simple molecule. Our high school children could synthesize aspirin in a high school biology laboratory and make an effective version of that medicine. So, in terms of its size and molecular complexity, relatively straightforward. Proteins, by contrast, are thousands or even tens of thousands times more complicated than that aspirin. And they are molecules, which you can't just swallow orally, they're molecules that are largely injected or given intravenously to patients for a variety of reasons. But the point is they are very complex medicines. The magic of biology and biotechnology was that in the late 1970s, it became possible for the first time to create these complex proteins by doing it the way Mother Nature does it. How does Mother Nature make these complex medicines? They're made in living cells. And some experiments in the 1970s showed that you could take the genetic instructions from one organism and then inject it into another and create the desired protein. And that enabled us to create medicines for diseases that we knew were the result of deficient proteins for the first time. Again, Amgen was at the vanguard of doing that, and our first few medicines were successful in the way you described, Simon. And that success gave encouragement to hundreds and hundreds of other companies to try to repeat what Amgen had done by making available for the first time these proteins that doctors knew were the key to keeping people well, but which doctors had no means of otherwise producing.

[Mid-Roll Ad Break]

Simon Brewer

So, one of your papers that I read was on obesity and it was titled Why It's About Biology Not Behavior, and that had me scratching my head a bit. So I'd love you to just expand on that.

Robert Bradway

Well, obesity exists at the intersection of genetics and the environment. So, it may surprise you to learn that something on the order of 40 to 70% of the inter-individual variability in obesity, or body mass index, is accounted for by genetics. Now, there are very good reasons from an evolutionary standpoint why that might be true or why that evolved the way it did. So you can imagine that there was, once upon a time, an evolutionary advantage for people who were able to store energy more effectively as a result of their genetics. The challenge of course is we live in an environment today where there's an abundance of food available to us, so it's no longer as advantageous as it once might have been for us to be able to store excess energy as fat. And in fact, unfortunate thing of storing excess calories as fat, is that those fat cells are not metabolically inert. They're active and they're sending mischievous signals around the body. And if there are enough of those fat cells for a long enough period of time then they give rise to a variety of other disorders and diseases. And that's why obesity is the enormous problem that it is today from a public health standpoint. So, there are lots of these chronic diseases that we're all familiar with that are such a challenge for our societies today that are caused by this lifetime exposure to too much fat or adipose tissue. And again, that's why we and others are excited about, for the first time, being able to introduce therapies that might make a difference in that disease.

Simon Brewer

So, one of our former guests who you know, Dame Kate Bingham, said that you, Amgen, if not you personally, acquired one of her early portfolio companies, Micro Met, in the cancer space. And her question was simply, was it a good acquisition?

Robert Bradway

We're very, very excited about Micro Met. In fact, if you've read The Emperor of Maladies, if you haven't I'd encourage you to read it, but if you've read it, the book starts with a patient who's suffering from a relapse of this form of leukemia and you get a sense for how terrifying it was for the physicians treating such patients because they knew they had very little, if anything, available to help patients at that stage of the disease. And that's where Micro Met comes in. And just briefly, Simon, what Micro Met does is we engineer a protein which on one end binds the cancer cell, so cancer cells very often have on their surface a distinctive signature. And in the case of acute lymphoblastic leukemia cells, they have a very distinct signature. So on one end, our protein binds that distinct signature, and on the other end, our protein binds a cell from the immune system, and the cell from the immune system then grabs hold of that cancer cell and destroys it. And so the idea is to try to harness the body's own immune cells and get them to hone in on these cancer cells that are circulating in the body and eliminate them. And again, the data shows spectacular results from that. And more broadly, we're exploring this in a number of different diseases and I think people are very excited right now about the results that we see in small cell lung cancer, where unfortunately the long-term survival rate is an abysmal 3% today. And then there are a variety of other cancers as well where we are applying Micro Met technology. So, the answer to Kate is yes, we're thrilled with the acquisition and we think it's been great for us, and for the field more generally.

Simon Brewer

Well, I'm sure she's very happy. She may think that she sold it to you too cheaply. But that was a long time ago. So, she was, as you may know, a guest on the show, a very popular guest last year. And again, described her area of work, I thought, brilliantly. I was catching up with a former Morgan Stanley colleague, Tyrell Young, who asked the question, how is Amgen using AI to assist in its drug development?

Robert Bradway

This is an incredibly exciting moment in time. You referred to Steve Jobs at the outset of the call, and I think in so many areas he was a visionary and in this field he was as well. We like to say, Simon, that we're living at the dawn of the bio-century, living in a moment in time where the knowledge that we're generating in the field of biology is truly staggering. The pace of change and rate at which our knowledge is improving is really, really impressive. And one of the reasons that it is, is we're able to deploy technology now against the huge amount of data that we generate in biology to better understand what the data are trying to tell us. And AI will help extend and improve, no doubt, the rate at which we're innovating and the insights that we're generating. And we've been very aggressive at deploying tools of machine learning and artificial intelligence across our business. So, from the research phase right through to manufacturing and our commercial interactions. But just very briefly, let me touch on one of the big moments in the field which occurred in the summer of 2021. When Google's DeepMind subsidiary, which will be familiar to you from its presence in the UK, Google's DeepMind unit revealed and made available for the first time its software. And that software enables us to predict the structure of proteins. And that was a huge moment in the artificial intelligence field, but also in the field of biology. In the artificial intelligence field because scientists there had been trying for decades to figure out how to program in such a way that you could anticipate how these large complex proteins come together and create a three-dimensional structure. That structure's important to us in the world of drug discovery and development. We need to know what the shape of a protein is in order to figure out where to grab onto a medicine that we're trying to use against it. And so, the way that we've had to do it historically is by crystallizing a protein and looking at it with very expensive equipment, it takes months and months and sometimes years to do using highly trained PhDs to help us discern the structure of a molecule. When DeepMind revealed its alpha fold software, and then there were several others in quick succession, it became possible to generate a computer model for these three-dimensional structures. And so that has enabled us potentially, not in every instance, but to cut out months and in some cases even years of work at the outset of trying to design medicines. So we've had some successes already, I'm sure others in the field have. And, no doubt, artificial intelligence will open the door to another era of more rapid and hopefully more profound innovation.

Simon Brewer

So I'm going to jump to your pressures on the US. So, Bob, we live in a world where there are inflationary pressures, but there's also the spotlight falls on drug pricing and the costs of getting something through. And I think that everybody would like to have cheap solutions. But the reality is there are some significant forces at work, from aging, onwards. Could you just share with us how you view that equation?

Robert Bradway

There are some really important megatrends here for sure. So, the tailwinds for the industry right now are demographic. The aging planet that we live on is giving rise to enormous demand for what it is that we do. That's in the form of innovation against the diseases of the aging process. What are those? Cardiovascular disease, cancer, neurodegenerative diseases, osteoporosis. Those are the inevitable consequences of the aging process. And as our planet gets older, the number of people who are at risk of those diseases is growing and the demand therefore for innovation is enormous. Now at the same time, the world is getting wealthier. And as the world gets wealthier, the world develops more and more of the first world disorders, obesity, cardiovascular disease, kidney disease. So we have those two things happening at once. You have a world that's getting older, you have a world that's getting wealthier, and as a result we have chronic disease reaching levels that we've never seen before on this planet. And the inevitable consequence of that is that we have a lot of pressure from governments very understandably to try to get after that cost by focusing on what their drug budgets are. And so as countries look at their drug budget, they see, gosh, they're going up each year. And they're going up because the volume demand for what it is that we do is growing. So as an industry, we have to learn now to operate at different price points than we have historically. We have to recognize that that pressure on our pricing isn't going to go away, and it's our responsibility to demonstrate to society the value of innovation. To demonstrate and to prove why it makes sense to invest in innovative new therapies and to adopt those therapies widely. There's no question that it's in a country's macroeconomic best interest to adopt innovation, to keep people healthy. There's no reason why people in the UK should be having heart attacks as frequently as they are. Those heart attacks can be prevented. But we need to do a better job of helping the British government and the British people understand, for example, why it's a pro-growth solution to invest in innovation that can keep people well.

Simon Brewer

Did I understand a statistic right that I read in Amgen's papers, that in the US at least, someone has a heart attack every 43 seconds?

Robert Bradway

In the US? That's correct. In the US every 43 seconds somebody has a heart attack, and strokes are just as bad. And again, Simon, there's no reason for us to tolerate that as a society. We know what the bad actor is in that process. The bad actor is LDL cholesterol, and we know we can do something about it.

Simon Brewer

Stepping back from biology, you're running an immense corporation. What would you say is your biggest challenge in getting your arms around that?

Robert Bradway

I think, Simon, one of the things that people sometimes misunderstand or don't fully appreciate is how important it is to have alignment in a large organization. And we're very fortunate that we have tens of thousands of people around the world, and as I mentioned previously, in more than a hundred countries. But we're very fortunate that we have a tool which works really well to align all of us, which is our mission. And the beautiful thing is everybody understands in this company, that they have an opportunity to make a difference for a patient that's suffering from a serious disease. And that's a special feeling. So, alignment and making sure that everybody understands the mission or purpose of the organization, and we have that North Star and it has served us well since we were founded and it continues to today.

Simon Brewer

And would you say that people are unified in seeing what the biggest challenge or challenges are over the next five years?

Robert Bradway

Well, I think we're fortunate as well, and certainly I think our leaders understand the challenges that we're facing. The challenges we're facing include obviously a high inflationary environment. We face pressures globally on drug prices. And we face an incredibly competitively intense environment, which means we need to move quickly, we need to recognize that we're in a hotly competitive field. And one of the things Amgen prizes is competing intensely to win. That's not just about the effort, it's about making a difference for patients. We want to win for the patients. And we recognize that we're in a race, we're in a race against serious disease, and often we're in a race against our competitors as well. We'll be the first to define the benefit of a new therapy for people that are suffering from challenging diseases.

Simon Brewer

Back into the investment world. You guys are going to get setbacks, tell me a little bit about how you deal with them as they come along. And I mean a little bit emotionally because we've got leaders who may be CIOs or running hedge funds, et cetera. And when the wind is in your face, it's very interesting to hear how leaders react.

Robert Bradway

We're in a business where nine out of 10 times we fail. If you can fail eight times out of 10, you're a Hall of Famer. So we're in a business where failure is just a fact of life, and sometimes that failure occurs 10, 12, 15 years after we've committed and been investing in a project. And that can be frustrating as heck. The beautiful thing about our field, however, is that we learn. We learn from failure. When we've embarked on a project that we had high hopes for, and invested a lot of time and energy in, and we generate that final set of data and the data tell us the medicine didn't work, of course that's discouraging. But the beauty of it is we're able to step back and say, okay, what did we learn? Is there anything that we learned that makes us want to go back at it differently or anything we can learn that we apply to the next project that we're working on? So, on the one hand, it's the most challenging feature of our world, is that people can work very hard on things that look really interesting, but they just don't work out in the body. On the other side, it makes those moments when you do have an ah-ha

breakthrough and you generate the data that shows you've really made a difference for a patient and the patient's family, it makes those all the more special. And we've been very lucky throughout history to have had a lot of those moments. So, whether it's for bone disease and particular the risk of fracture, to osteoporosis or whether it's from kidney disease, we've had those moments where we look at that data and we know that we are sitting on a really important, valuable innovation for patients that are suffering from tough challenges.

Simon Brewer

Well, none of us would survive in the investment world if we had those success rates. So, I think I chose the right profession. Bob, I've got a few closing questions for you. Who's been, and why was that person, a significant mentor to you?

Robert Bradway

I've been fortunate to have a few great mentors in my life. I would say my predecessor was an extraordinary mentor, extraordinary teacher and coach. So I was very, very fortunate to have someone like him as I transitioned from financial services industry into biotechnology. I've also been very fortunate to have a former board member who was a distinguished leader of McKinsey for many years, considered one of the founders of strategy, to serve as a mentor throughout my career here at Amgen. So I've benefited tremendously from having people that have been through some of the things that I'm going through and can help me think through challenges and look around corners. So, really grateful to them for that.

Simon Brewer

At the other end, you are talking, and your colleagues are talking, to young people, students, who are thinking about joining Amgen and the world of biotech. What advice would you give them?

Robert Bradway

First of all, I'd say it's an incredibly rewarding field to be part of. Again, one of the beauties of being in an organization like ours is the ability to make a difference for people at a moment in their lives when they really need help. And so, biotechnology gives you the opportunity to be part of an organization that's there when a patient and their family are most desperate for some innovation that can give them prospect of a quality life. It can help them return to health and live a fulfilling healthy long life. And so having that as a North Star in an industry like this is, I think, what attracts people to the industry and those who stay here find that that becomes a really important part of what makes them tick inside their organization. So, first thing I'd say, incredibly rewarding opportunity. Second thing I would say, is be prepared for a pace of change that is just simply stunning, and maybe encourage them to be a little bit humble as well. I think sometimes we believe we know an awful lot about, for example, biology, but with each passing day I'm reminded how little we actually know today about this field. So, it's an exciting, fast changing field and opportunity, I think, to really make a difference.

Simon Brewer

Amgen is a founding member of the OneTen Coalition, with the goal of hiring a million black Americans into well-paid jobs over the next decade. How do you help that journey?

Robert Bradway

Ours as an industry in which, in particular, African Americans have been underrepresented. And so, one of the things that we're focusing on is trying to understand what have been some of the reasons historically why we haven't been able to attract people to our industry from that community. And what are the things that we need to do to make sure that when we do attract people to our organization, we can help them develop and flourish and thrive. And so, we've committed publicly to being part of a group that has a 10-year commitment to try to improve the representation of African Americans, black Americans, in family sustaining career related roles.And it's been an interesting journey. One of the things I think we, and others in the field, have learned is that we probably have been specifying credentials for our roles that were not necessary, and that had the effect of not making us attractive to some of the talent that we're trying to draw into our organization. So, rethink how we go about

recruiting, how we specify the kinds of things we think we need for the jobs we're hiring for, and then to make sure that we're creating an environment where when people get here, they feel like they belong and feel like they can make a contribution.

Simon Brewer

Bob, I know that a long time ago you were always a keen golfer, and we ask this question occasionally to a guest who has that passion. If you could play any golf course in the world, where would it be? And you're allowed to take one guest, who would that guest be?

Robert Bradway

Oh my heavens. All right. If you grant me a sunny day, Simon, I might say I'd go up to Northern Scotland. Fly into Inverness and rent a car and drive out to Royal Dornoch, because on a sunny day there's few more wonderful experiences than that. Who would I play on that course with? Well, Simon, I would hope you were available on that sunny day. We'll get up there together and we'll have fun thinking about the old times.

Simon Brewer

Oh, gosh. Well, I'm sure you can do much better than me. Thank you very much. I'll be there at the airport in Inverness. That's been a terrific conversation and we could go on and I could pick your brains, but I think you've given us a great summary of your industry, of Amgen's priorities, of the complexities, which my goodness, make the regular investing world seem significantly more welcoming and less hostile. But boy, you're making a real difference. So, that's been absolutely terrific. I've taken two things away, the book that I've never heard of which we'll put on our show notes, is The Emperor of Maladies, so that'll be on the list. So, thank you. And you have said it jives with what the late Steve Jobs has said, that we are at the dawn of the bio-century and the speed of change and the tools which are being employed are probably unrecognizable from our predecessors. So, thank you so much for giving us your time today, Bob, and for sharing so much with us.

Robert Bradway
Thank you, Simon. Great pleasure to be here with you.