

# Ivor Royston

*Interview conducted by  
Matthew Shindell, Historian, UCSD  
October 14, 2008*

SAN DIEGO TECHNOLOGY ARCHIVE



## Ivor Royston



Dr. Ivor Royston, M.D. is a Managing Member at Forward Ventures II, IV and V L.P. Dr. Royston has been involved in the biotechnology industry from its inception in 1978 with the founding of Hybritech, Inc. and of Idec Pharmaceuticals in 1986. He has been instrumental in the formation, financing, and development of numerous biotechnology companies, including Corixa and, Genstar Therapeutics. Dr. Royston Co-founded Beckman Coulter, Inc., Biogen Idec Inc., and GeneSys Therapeutic Corp. He is the Founding Chairman of Quantum. He served as the Chairman of Corautus Genetics Inc. from April 1997 to August 1998. Dr. Royston served as Chairman of Deltagen Research Laboratories, L.L.C., Imagine Pharmaceuticals, Inc., Morphotek, Inc., Sagres Discovery, Inc. and TargeGen, Inc. Dr. Royston served as Chairman of CancerVax Corp. since December 2000. He is a founding Director of Genesys Therapeutics, GenQuest, CombiChem, Sequana Therapeutics, Triangle Pharmaceuticals, Applied Molecular Evolution, and Variagenics. He serves as Director of HemaQuest Pharmaceuticals, Inc. and Syndax Pharmaceuticals, Inc. Dr. Royston has been Member of the Board of Advisors at MMRGlobal, Inc. since May 2010 and has been its Director since May 27, 2013. He serves as Member of the Board of Advisors of MyMedicalRecords, Inc. Dr. Royston serves as a Director of Arizeke. He has been Director of Biocept, Inc since April 11, 2011 and Avalon Pharmaceuticals, Inc. since August 2000. Dr. Royston served as Director of Conforma Therapeutics Corporation, LigoCyte Pharmaceuticals, Inc. and Altair Therapeutics, Inc. He served as its Director at MMRGlobal, Inc. from January 2000 to January 2009. He served as Director of VIA Pharmaceuticals, Inc. until June 05, 2007, Micromet, Inc. until May 05, 2006, Corautus Genetics Inc. since February 5, 2003 and Favril Inc. since January 2000. Dr. Royston also served as a Director of Clinical Immunology Program at the UCSD Cancer Center and Chief of Oncology at the San Diego VA Medical Center. From 1990 until 2000, Dr. Royston was the President and Chief Executive

Officer of Sidney Kimmel Cancer Center (formerly the San Diego Regional Cancer Center). From 1977 to 1990, he held various positions in academic medicine and cancer center at the University of California, San Diego (UCSD) School of Medicine. Dr. Royston was on the faculty of the medical school and cancer center at the University of California, San Diego from 1978 to 1990. In 1997, President Clinton appointed him to a six-year term on the National Cancer Advisory Board. Dr. Royston is trained in internal medicine and oncology at Stanford University and is board certified in both Internal Medicine and Medical Oncology. He is a nationally recognized physician-scientist in the area of cancer immunology. Dr. Royston received an M.D. in 1970 from The Johns Hopkins University, a B.A. in Human Biology in 1967, and completed post-doctoral training in Internal Medicine and Medical Oncology at Stanford University.

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**INTERVIEWEE:** Royston, Ivor, PhD  
**INTERVIEWER:** Shindell, Matthew, Historian, UCSD  
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6 **ROYSTON:** Okay. Well, thank you Matt. My name's Ivor Royston. Does that sound, is  
7 the level good? Or . . .

8 **SHINDELL:** The level looks great. (Royston: Okay.) So, this is an interview with Ivor  
9 Royston. It's October 14, 2008. The interviewer is Matthew Shindell.

10 **ROYSTON:** Okay.

11 **SHINDELL:** Dr. Royston, if you could please tell us . . .

12 **ROYSTON:** How I got involved with . . .

13 **SHINDELL:** How did you get involved in San Diego biotech?

14 **ROYSTON:** Well, it goes back to when I came down to San Diego with Howard Birndorf,  
15 since you mentioned his name. So, let's go back to – I'm doing my – I mean, I don't know  
16 how far back you want me to go, but we'll, let's go back to the fact that in 1975-77 I was a  
17 postdoctoral fellow at Stanford Medical Center doing my oncology fellowship, which was  
18 required to ultimately become a board certified oncologist, [1:00] which was my goal  
19 (Shindell: Uhm-hmm.) I had already completed internship and residency in internal  
20 medicine. I'd done research at the NIH, and there's some great stories there too, [Laugh] I  
21 have. And, and then, and then I finished up by doing my fellowship at Stanford. And,  
22 when I was at Stanford it was, and I had experience, as I mentioned, doing medical

23 research, especially immunology and cell biology research (Shindell: Uhm-hmm.) at NIH  
24 in the years beforehand. An article appeared in *Nature* magazine which demonstrated the  
25 ability to make monoclonal antibodies. It was written by George Kohler, and Caesar  
26 Milstein, who ultimately, years later, won the Nobel Prize. And in that article, they talked  
27 about how you could make antibodies [2:00] in a cloned manner, a large number of highly-  
28 specific antibodies, which had never been done before. Because, in the old days if you  
29 wanted an antibody you would just bleed a goat or a sheep or, (Shindell: Uhm-hmm.)  
30 anyway, and so, you know, if you wanted an antibody to let's say to a virus you would  
31 inject the virus into an animal, the animal would make antibodies, and you bled the animal  
32 and you took out the serum and you would have antibodies. The only problem is, it was a  
33 mixture of all kinds of different antibodies, many, many hundreds of types of different  
34 antibodies and it would never be an unlimited amount of any given antibody. When  
35 Kohler-Milstein discovered that you could make unlimited amounts of a single antibody by  
36 using certain genetic engineering techniques that we call "cell fusion," it was analogous to  
37 the, [3:00] the people who had cloned DNA (Shindell: Uhm-hmm.) and developed the  
38 recombinant DNA revolution, which is, as you know, the ability to make unlimited  
39 amounts of protein from a single DNA. This sparked the whole biotech revolution. So  
40 here, I saw the same potential and I realized, "Boy, if we can make unlimited amounts of a  
41 cloned antibody maybe we could develop antibodies as a new weapon for treating cancer.  
42 (Shindell: Uhm-hmm.) Remember I'm studying to be a cancer doctor and my goal was to  
43 be on the faculty of a major cancer center, and I realized at that point, while I was at  
44 Stanford that this was an area that I wanted to pursue. When I read the technology about  
45 how you did this, I said, "Well, I know how to do that. I can do this and do this. I've had

46 that experience. And, I talked to Howard about it, who was working as a technician there  
47 (Shindell: Uhm-hmm.) and I started writing grants in anticipation of doing that, knowing  
48 that ultimately I'll be winding up [4:00] at some place, some university. And so, where I  
49 ended up was getting an offer from UCSD to come and join the new cancer center that was  
50 being developed at UCSD in 1976 – by John Mendelsohn. This is the same John  
51 Mendelsohn that's now head of MD Anderson, who we just talked about. (Shindell: Uhm-  
52 hmm.) He was starting the Cancer Center at UCSD and was looking for several new  
53 faculty members to help him get started. And, I applied for that job and I was one of three  
54 that was chosen to head up the Center, (Shindell: Uhm-hmm.) and to be the head of  
55 clinical immunology. When John he interviewed me he said, "What do you want to work  
56 on?" I said, "Well, I want to make monoclonal antibodies to treat cancer." And, of course,  
57 nobody knew what monoclonal antibodies were. Dr. Mendelson went on to become the  
58 inventor of Erbitux, which is one of the major antibodies today that's used to treat cancer.  
59 (Shindell: Uhm-hmm.) So, I said to Howard, "Hey," you know, Howard I got to know him  
60 and we did some stuff together at Stanford. I said, "Why don't you come down with me to  
61 San Diego. I got the job. Why don't you come down to me, [5:00] with me, and we'll work  
62 on this new technology for making monoclonal antibodies?" So, first thing we did, we set  
63 up our lab and, in 1977 I took the job in July of 1977. It was many years ago now, right?  
64 That's what? We're already in '08 so that's thirty years ago (Shindell: Uhm-hmm.) we're  
65 talking about. It was back a long, time. So, we set up the lab. Howard was my chief  
66 technician. And, I said, "Okay, why don't we work on leukemia. Let's take some leukemia  
67 cells and show that we can make a monoclonal antibody that reacts with leukemia but does  
68 not react with normal white cells to show that we can get a highly specific (Shindell: Uhm-

69 hmm.) antibody." And so, we're using the Kohler-Milstein technology. We went ahead and  
70 did this. Now, I have to, I'm going to diverge a little bit, more than I would normally for  
71 you because Clay (movie producer) is here. (Shindell: All right.) Because there are some  
72 real great vignettes and anecdotes that he'll be interested in them maybe more so than you.  
73 But, maybe I'm wrong. [6:00] Maybe anybody would.

74 So, when you make these antibodies it's like making bread. You have to have yeast  
75 to (Shindell: Uhm-hmm.) to make bread, right? To make these antibodies you need a cell  
76 line that you need to fuse with antibody-creating cells that you take out from the spleen of  
77 an animal, in this case (Shindell: Uhm-hmm.) mice, and you fuse them together and that,  
78 and you create what is called a hybridoma, (Shindell: Uhm-hmm.) a hybrid of both cells.  
79 So, the antibody cells from the spleen of the animal are programmed to make an antibody,  
80 (Shindell: Uhm-hmm.) but the cell line has the immortality factor n- it can grow forever.  
81 By fusing them together I created a cell line that could make a single antibody forever,  
82 (Shindell: Uhm-hmm.) That's the whole idea. So, the question people have often asked me  
83 when they talk about starting the industry down here is, "Well, where did the cell line come  
84 from, this specific cell line?" Well, it, this is a very interesting story, because in those days,  
85 in 1977, there was no [7:00] such thing as an MTA, a Material Transfer Agreement.  
86 (Shindell: Uhm-hmm.) Today you can't send a biological cell line from one institution to  
87 another without signing an agreement that you won't commercialize it without the  
88 institution's approval. (Shindell: Uhm-hmm.) . So, here's what happened. When I got the  
89 idea at Stanford that I wanted to work on monoclonal antibodies for treating cancer, I knew  
90 that I needed the cell line, and (Shindell: Uhm-hmm.) the only cell line I knew was the one

91 that was developed in, in England by Kohler and Milstein who later won the Nobel Prize.  
92 I found out that one of the professors at Stanford –  
93 **SHINDELL:** Would you like me to pause it?  
94 **ROYSTON:** No. That's all right. So, thirty years ago, this professor was at the laboratory  
95 at Kohler and Milstein on a sabbatical when the discovery was made, and while I was at  
96 Stanford [8:00] . When he heard about this discovery he actually brought the cell line  
97 back to Stanford. (Shindell: Uhm-hmm.) And,—then one of my colleagues in the oncology  
98 department at Stanford got a hold of the cell line and started to do some experiments, and  
99 then I also got a hold of the cell line from there. People were just – and, knowing that  
100 someday I was going to do this, and I had my own liquid nitrogen tank (Shindell: Uhm-  
101 hmm.) that I, even though I did not have a faculty position I had my own liquid nitrogen  
102 tank that I brought from NIH and parked in a professor's laboratory and made him a deal. I  
103 said, "Look, if you fill this up on a regular basis with liquid nitrogen to preserve it, I will let  
104 you share some of the cells that are in my liquid nitrogen tank." [Laugh] Because I, what I  
105 did was, when I was at NIH, before coming to Stanford, I had worked on a number of  
106 projects and I gathered a large number of what I, cell lines, which we kept in a frozen state  
107 in liquid nitrogen [9:00], and I felt that in my future career I might need those cells. So,  
108 what I did is I arranged to decommission the tank at the, at NIH. That's the words that they  
109 use in the government. To "decommission" means to get rid of it, and so I was free to take  
110 the tank with me. So, I took this liquid nitrogen tank in a truck and took it cross country  
111 from Bethesda, Maryland to Stanford, where I had my fellowship. So, I actually drove that  
112 tank [Laugh] full of liquid nitrogen and cells, personally, to Stanford as a young physician,  
113 knowing that I might need it someday. So, when I got to Stanford I had to have a place to

114 put it. So, I went up to this doctor, (Shindell: Uhm-hmm.) I won't go into the names here,  
115 and said, somebody I got to know and befriended, and I said, "Look, I have hundreds of  
116 different cell lines here that you may want to use. I'll let you use them. Just do me a favor,  
117 keep this tank full with liquid nitrogen." (Shindell: Uhm-hmm.) He said, "Fine." So,  
118 when I found out that this Professor brought this cell line from – see, this is stuff that no  
119 one's ever documented (Shindell: Uhm-hmm.) before [10:00]. When I found out that he  
120 had this cell line, that he had just visited Kohler and Milstein where this Nobel Prize  
121 winning discovery was made, that cell line was now at Stanford. So, I got a hold of it,  
122 because everybody, I mean in these labs there were people starting to work with it.  
123 (Shindell: Uhm-hmm.) I just took some, froze it down, put it in my cell tank, in my tank,  
124 (Shindell: Uhm-hmm.) that belonged to Ivor Royston. So, I now had the cell line in there.  
125 That's a long story, because when I moved to San Diego the tank followed me. [Laugh]  
126 So, when I moved I put the tank, the UCSD paid for the moving expenses, so I took my  
127 liquid nitrogen tank, put it on the moving truck, [Pages turning] and it moved it south from  
128 from Stanford to San Diego. So, when I got to San Diego I just pulled out the cells, with  
129 Howard, (Shindell: Uhm-hmm.) and I'll bet you he didn't even tell you this story -- so, I  
130 pulled out the cells from the tank and we started saying, "Okay , we're going to start  
131 working on monoclonal antibodies." I had a grant (Shindell: Uhm-hmm.) from the NIH.  
132 We're going to start working on making monoclonal antibodies for leukemia. The issue is  
133 you have to have those cells. (Shindell: Uhm-hmm.) So, okay. I wasn't the only one that  
134 had those cells. Those cells [11:00] were actually distributed. I mean, if I had asked for  
135 them officially they probably would have sent it, okay? (Shindell: Uhm-hmm.) I mean,  
136 I'm just injecting a little humor about how I personally got the cells down. But, we get into

137 a more serious issue about when I started the company Hybritech, (Shindell: Uhm-hmm.)  
138 how the cells got from UCSD to the company. That's a more serious issue, because there  
139 were no rules and regulations then. So at UCSD so we started out to make these antibodies  
140 to leukemia. Well, we were very successful. That's the nice thing about, about something  
141 that really works. (Shindell: Uhm-hmm.) We started doing the experiments and they  
142 started working just, you know, on schedule, and became very, you know, it worked really,  
143 really well. We took, we injected these leukemia cells into mice. We took the spleens out  
144 of the mice. We fused it with our cell line that I had just grown up from the liquid nitrogen  
145 tank that we know had worked, published in *Nature*, and we fused them and sure enough  
146 we had cells growing in culture that were making antibodies to leukemia cells. And then,  
147 the eureka moment was when we tested those antibodies we found out we could pick out  
148 antibody clones that reacted just with the [12:00] leukemia cells and not with normal white  
149 blood cells. We were looking for that, what we call that tumor-specific antibody.  
150 (Shindell: Uhm-hmm.) And, I said "Howard, we've got it. This is fantastic. We can now  
151 go ahead and treat cancer, but how but how? (Shindell: Uhm-hmm.) How am I going to  
152 grow it up in large scale?" You know, you need to grow out from there. "How am I going  
153 to make gram quantities of the stuff and how am I going to purify it? How am I going to  
154 manufacture it? How am I going to do whatever?" I was stuck. But the idea was, "Yeah,  
155 but how do I get to the next step of implementation?" (Shindell: Uhm-hmm.) So, Howard  
156 would say to me, "Well let's, we'll license it to a company. Well, you know, let's go talk to  
157 a pharmaceutical company." So, I go talk to Eli Lilly, (Shindell: Uhm-hmm.) or, or Smith  
158 Kline, or whatever the companies were in those days, and, and they didn't know what I was  
159 talking about. And I said, "Well, I'm cloning these antibodies." Now, we're talking 1977,

160 the end of '77. The invention was only made in '75 at, you know, people were not really  
161 (Shindell: Uhm-hmm.) I mean nobody, it was really still very early and people didn't  
162 [13:00] , you know, couldn't relate to me. "What do you mean growing antibodies in a test  
163 tube?" You know, there was nobody that really understood what I was talking about. So, I  
164 said to Howard, "You know, when we were at Stanford, you know, when people had these  
165 great ideas they started companies, like Genentech, (Shindell: Uhm-hmm.) and my  
166 professor, John Daniels, started a company called Collagen. Maybe we just need to start  
167 our own company." And he said, "Okay. Let's do that." So, I said, "Well, you know, we're  
168 going to have to write a business plan or something," and so I went to the library and got a  
169 book about how to write a business plan. (Shindell: Uhm-hmm.) But then, I had just  
170 gotten married and I married a woman that I had met at Stanford, who came down from  
171 Stanford and joined me. So, now I was married and she was a nurse at Stanford and we had  
172 had a relationship going on, and when I left to come [14:00] to San Diego she still was at  
173 Stanford And I said, "Look, why don't you move down to San Diego so we can continue the  
174 relation[ship]. It's hard for me to get up there. (Shindell: Uhm-hmm.) I'm on the faculty  
175 at UCSD." And so she came down and we got married. then one day I was talking to her  
176 about this whole thing, I said, "I think we ought to start a company because these pharma  
177 companies don't know what I'm talking about. (Shindell: Uhm-hmm.) We'll just start our  
178 own company, because we got to manufacture these antibodies, got to get them into  
179 patients if we want to cure cancer." I was only focused, at that time as a young  
180 investigator, you know, I was here, in San Diego to figure out a way to cure cancer.  
181 (Shindell: Uhm-hmm.) That's what my whole life was, from a, as an eight-year-old boy I  
182 was programmed to go into oncology, to go to medical school, to go into cure cancer.

183 **SHINDELL:** What drew you to oncology?

184 **ROYSTON:** The curiosity. The intellectual curiosity that no one knew anything about  
185 cancer. I had nobody who died of cancer in my immediate family. Later on my mother  
186 passed away from cancer (Shindell: Uhm-hmm.) when she was seventy-five, but when I  
187 grew up there were no cancer deaths in my family, except for a distant [15:00] cousin, who  
188 had Hodgkin's Disease and died, but I didn't know him very well. But, it was more like  
189 when people talk about cancer, "Well, what is cancer?" You know, when they talk about it  
190 it's, "Well, cells are growing and killing." No one knew what – it was a black box  
191 (Shindell: Uhm-hmm.) and I was driven by the intellectual curiosity (Shindell: Uhm-  
192 hmm.) and felt that that's the next frontier in medicine – I knew I wanted to be in, go into  
193 medicine and that, that I had chose cancer. So, and it was only when this discovery was  
194 made that I chose to focus on, "Well, let's use this new technology for developing the magic  
195 bullets for treating cancer." (Shindell: Uhm-hmm.) So, I'm talking to my wife. My wife  
196 said, "Well, you know, I met this guy up in the Bay Area, you know. I dated him once and  
197 he called, he said he was, he called himself a 'venture capitalist.'" And, I had never heard  
198 the word "venture," I really didn't know what a venture capitalist was, which is the irony,  
199 right, then, because now [Laugh] we're venture capitalists. He knows that, because many,  
200 thirty years later I am a venture capitalist. [Laugh] And, but in those days I didn't know  
201 what a venture capitalist – I said, "Well, what do they do?" And she says, "Well, you  
202 know, they start companies, they invest in [16:00] companies. That's how Genentech got  
203 started." And so I said, "Well, maybe I should talk to one of these guys?" And, she says,  
204 "Well, okay, I know this guy Brook Byers." It's now Kleiner Perkins Caufield & Byers,  
205 (Shindell: Uhm-hmm.) which is the number one venture capital firm. I said, "Why not

206 give him a call?" So, she calls him and she says, you know, "My husband's got this idea."  
207 And he said, "Well," just to be nice to her he says, you know, "He's going to be in San  
208 Francisco at a meeting can he stop by and talk to you or have lunch with you?" And, he  
209 wants to be, he's being nice to her because he had [Laugh] known her once before, or dated  
210 her once. He said, "Sure. Have your husband get in touch with me and (Shindell: Uhm-  
211 hmm.) stop by." So, I had this pivotal lunch in San Francisco and it would have been in the  
212 summer of '78. And, the reason I know that, because when, ultimately when he finally got  
213 involved it was October. Well, somewhere around, well maybe late spring, early summer  
214 of '78. But, we had made our, when we, when I moved to San Diego in July of '77 and set  
215 up my lab we had [17:00] those results about, with the antibodies differentiating leukemia  
216 cells from normal white blood, so we had that like in about six months. (Shindell: Uhm-  
217 hmm.) It was really, we were very lucky, very fortunate. Things really worked out well,  
218 and Howard was my chief technician then. So, I met with Brook Byers, who was the junior  
219 partner, had just joined the firm a little bit earlier. He was trying to make a name for  
220 himself, and I obviously said all the right things at the lunch, because I said, "You know,  
221 Brook, nice to meet you and all that. You know, I have this idea," and I said, "you know,  
222 just like you can clone genes to make insulin," that's what they did at the time, "insulin and  
223 human growth hormone" – that's what Genentech had done in those days, (Shindell: Uhm-  
224 hmm.) – "you know, we can also clone antibodies now by using this new technology." So,  
225 that resonated with him, cloning genes and cloning antibodies. And I said, "Cloning  
226 antibodies will be just as big as cloning genes, (Shindell: Uhm-hmm.) because there are so  
227 many different things you could do with antibodies." So he got it, so when I made the  
228 analogy between what I was doing and the, and the success they had had with Genentech,

229 because that was like a huge success at that time in 1978. [18:00] (Shindell: Uhm-hmm.)  
230 It had already gone public, as I recall, in 1976. And, they had already been making insulin.  
231 He said, "Do me a favor. Write up this, what you just told me today. Write it up and send  
232 me a, a little outline or plan of what we just talked about here, (Shindell: Uhm-hmm.) and  
233 tell me how you think this would work, and what kind of a business you could make out of  
234 it, and let me think about it." So, I went home and talked to Howard and, actually that's  
235 when we got the business plan book from the library. I said, "We need write up this this 5  
236 page document. (Shindell: Uhm-hmm.) That, that document still exists and the original  
237 is at the Chemical Heritage Society but copies have been used in business classes at  
238 Stanford Business School, where it's become the basis for entrepreneurial lectures. So, I  
239 have that document if you ever want to see it.

240 **SHINDELL:** Well, actually, Howard made me a copy of it.

241 **ROYSTON:** Okay.

242 **SHINDELL:** I think I have a copy. And actually, Ted Greene also (Royston: Yes.) told  
243 me about . . .

244 **ROYSTON:** It's now . . .

245 **SHINDELL:** Told me about the case study there. (Royston: Yeah.) Yeah.

246 **ROYSTON:** I Ted and I did the case study [19:00] at Stanford, it became a case study up  
247 at Stanford Business School, and this five-page document that I wrote, "Dear Brook," it's a  
248 five-page letter and I outlined the technology, why it was important, the competition – there  
249 wasn't any except for one small thing – and the funny thing is I said, "What would we do  
250 with these antibodies to make money?" And, so I realized, well the immediate thing was  
251 blood testing. Because, when I thought, "What's the most important application for

252 antibodies in 1978?" Well, (Shindell: Diagnostics?) the hepatitis blood test, which every  
253 unit of blood was screened against, was done with an antibody test, (Shindell: Uhm-hmm.)  
254 and they were using these impure antibodies that, extracted from serum of rabbits, or  
255 whatever, and I said, "We could make a much better test if you had a monoclonal antibody  
256 to hepatitis." And then, obviously the opportunity to make antibodies to many other agents.  
257 And, because most, many tests were antibody-based. (Shindell: Uhm-hmm.) So, I wrote  
258 that up as, you know, "We could make this diagnostics business and then maybe in the  
259 future, you know, we could work towards [20:00] making antibodies as therapeutics," but  
260 that, of course that's, it takes a lot of, a longer term. (Shindell: Uhm-hmm.) I sent that,  
261 that letter to Brook Byers. It is now well documented. As I say, it appears in a number of  
262 places, as you know, and he hired a due diligent expert, another scientist in the antibody  
263 space to read it and I guess it came back positive. And, the bottom line is, by September or  
264 so the whole team of Kleiner Perkins Caufield & Byers flew down to San Diego to our lab  
265 and met with Howard and me and (Shindell: Uhm-hmm.) we spent the whole day with  
266 them. We showed them how we made the antibodies, how we made the cell lines. We  
267 showed them the cells under the microscope, and then we showed how we tested for the  
268 antibodies. And, that afternoon they asked me, after driving them to the airport, and I  
269 think I was alone. That's right. Howard wasn't with me. And, we're at the airport and Tom  
270 Perkins, who's really famous today. (Shindell: Uhm-hmm.) I don't know if you know him.  
271 You know, he owns the Maltese Falcon, the boat, and he was married to Danielle [21:00]  
272 Steele. So, Tom Perkins says to me. "So, Ivor, how much money do you need to show me  
273 that you can make these antibodies outside the university? You know, you open up a lab  
274 somewhere else." So, I said, "Well, you know, we can do this for about," I said, "a couple

275 hundred thousand dollars. Give me a couple hundred thousand dollars and we can make  
276 some antibodies for you." And then Tom looks at me and says, "I'll give you \$300,000 and  
277 we'll take," I think he said, "we'll take sixty-five percent of the company. We'll form a  
278 company. I'll take, we'll take sixty-five percent. We'll give you \$300,000 and you and  
279 Howard, and all the future employees of the company will split up the other thirty-five  
280 percent." [Laughter] So, I said, "Fine." You know, that somebody was going to support us  
281 to start a company, that's all we cared about. We didn't know anything else. The biggest  
282 question I get at Stanford Business School, when I give the lecture, is, you know, "Why  
283 would you sell so cheaply?" (Shindell: Uhm-hmm.) Well, making money wasn't our  
284 primary objective. We weren't [22:00] there to make money - I was trying to figure out  
285 how to cure cancer in those days. So, they gave us \$300,000, and Howard will tell you  
286 stories about what he did with the check and how his car broke down [Laugh] and all that  
287 kind of stuff. Neither of us had ever seen that much money. I come from a lower-middle  
288 class family, . We had never seen a check for \$300,000 before. But, you know, they just  
289 wrote out a check. And, "Here's the money. Go put it in the bank." (Shindell: Uhm-  
290 hmm.) So, Howard was in charge. Well, I had made arrangement, at that point when they  
291 agreed to fund the company Howard agreed to leave my lab at the university and help set  
292 up the company, (Shindell: Right.) and build it because I, I was still a faculty member. He  
293 was a laboratory technician. (Shindell: Uhm-hmm.) So, he agreed to be the first employee  
294 and then he went out and he did a great job, because he then hired this really great scientist  
295 from Scripps to come and join him. (Shindell: Uhm-hmm.) And, and so the goal was, to  
296 prove to us that you can make an antibody outside the university." (Shindell: Uhm-hmm.)  
297 And, we had said, "Well, what antibody are we going to make?" So, I said, [23:00] "Let's

298 make hepatitis antibodies," (Shindell: Uhm-hmm.) you know. "Why not? It's the number  
299 one test being, I mean, that's being used for antibodies." So, that's what we did. (Shindell:  
300 Uhm-hmm.) So, we got a hold of hepatitis antigen and we started injecting mice with it  
301 and, and that was all done outside in a private laboratory. But, here's the interesting thing.  
302 So, the company, Hybritech, (Shindell: Uhm-hmm.) had formed. They needed the cell  
303 line. This is something that would never happen today. I took the cells out of my lab at the  
304 university and gave them to Howard and he took them over to the company, and that was –  
305 because the company had to have the cell line to (Shindell: Uhm-hmm.) have, to start to  
306 make the antibodies, (Shindell: And it was . . .) like yeast.

307 **SHINDELL:** It was that, that simple? Just move them over?

308 **ROYSTON:** That, it was that simple. It could not be done today. [Laugh] You can't  
309 move biological products that have commercial value (Shindell: Uhm-hmm.) from one  
310 university or, in one entity to another without all kinds of agreements. (Shindell: Uhm-  
311 hmm.) But in those days, it was the Wild Frontier, there were no, there was no biotech  
312 [24:00] industry, (Shindell: Uhm-hmm.) and there were no agreements, and no one even  
313 thought about implementing what we call an MTA, a Material Transfer Agreement,  
314 (Shindell: Uhm-hmm.) which came later, in the '80s, after people saw what happened.  
315 [Laugh] So, I took the cell line. And, no one's ever accused me of – we don't even know  
316 whose, who owned those cell lines. (Shindell: Uhm-hmm.) I mean, I got them from  
317 Stanford, and the guy from Stanford got them from Cambridge, and the guys in Cambridge  
318 never patented the technology, (Shindell: Right.) and they've been harshly criticized for  
319 that. The MRC in the UK lost hundreds and millions of dollars because the technology was  
320 never patented. (Shindell: Uhm-hmm.) Because scientists didn't think about patents. Here

321 was one of the most important discoveries ever made in England and it was never patented.  
322 (Shindell: Uhm-hmm.) Can you believe it? The Cohen-Boyer group in Stanford and  
323 UCSF patented the genetic engineering technology and they got a tremendous amount of  
324 royalties from all the genetic engineering companies, Genentech, Amgen, and so forth,  
325 (Shindell: Uhm-hmm.) [Cedes][24:55], and every company that was doing genetic  
326 engineering. But, in the monoclonal antibody [25:00] space there were no patents,  
327 (Shindell: Uhm-hmm.) and that's why I was able to do what I did. But, the company got  
328 off the ground because the cells that I brought down in my tank from Stanford [Laugh] to  
329 San Diego then made its way over to the company. The company gave birth in the labs of  
330 the La Jolla Cancer Research Foundation that had some additional space they were willing  
331 to lease to us. (Shindell: Uhm-hmm.) And so, Howard was in charge, hired the guys, and  
332 Brook Byers became acting president. He flew down here every week, spent a couple days,  
333 a few days. I was acting chief scientist and I did that after hours, and Hybritech gave birth,  
334 (Shindell: Uhm-hmm.) and then within, again, I guess we had the magic touch in those  
335 days, within three to four months we had antibody, we had pure monoclonal antibodies to  
336 hepatitis, (Shindell: Yeah.) all kinds of different subsets of hepatitis virus. So, we  
337 accomplished our goal, the milestone. Kleiner Perkins, the firm, was very pleased and they  
338 pumped in even more money into the company. (Shindell: Uhm-hmm.) [26:00] At that  
339 point, the next stage was they put in maybe, I can't remember if it's the stage they put in \$5  
340 million maybe, or a million, or \$2 million. I mean, in the millions. But then it came time,  
341 now that they saw this could really, this is for real, that we could reproduce what we did  
342 that it was time to get a permanent (Shindell: Uhm-hmm.) CEO, and that's where Ted  
343 Greene came. (Shindell: Uhm-hmm.) So, when we heard, Brook and I, that there was this

344 guy named Ted Greene, who was ex-Baxter executive, who a year after us had decided,  
345 "Well, maybe there was a future in the monoclonal antibody arena," and was going to put  
346 together a team to develop a monoclonal antibody company, well Brook and I said, " let's  
347 go talk to him because we need a CEO. (Shindell: Uhm-hmm.) Maybe all we have to do is  
348 convince him to be our CEO and then he'll drop his plans of trying to create a company that  
349 would actually compete with us." And that's exactly what we did (Shindell: Uhm-hmm.)  
350 and I think both Howard and I will remember the day when we [27:00] drove up to  
351 Newport Beach where Ted Greene lived and got together with him with Brook Byers and  
352 we suggested to him, "Look, we're already up and running. We've got, we've already made  
353 hepatitis antibodies with this, (Shindell: Uhm-hmm.) you know. We've got Kleiner  
354 Perkins, the number one venture capital firm behind us that started Genentech. Let's go –  
355 why don't you join us as the CEO?' (Shindell: Uhm-hmm.) And after all the protracted  
356 going back and forth he did that. He joined us as CEO.

357 **SHINDELL:** How did you all know that he was interested in monoclonals, because  
358 according to him he was trying to keep that . . .

359 **ROYSTON:** Have you already done the Ted Greene interview?

360 **SHINDELL:** Yeah. He was trying to keep that information sort of secret.

361 **ROYSTON:** But it got out.

362 **SHINDELL:** It got out? Okay.

363 **ROYSTON:** This is a small world, right? I mean, people, I don't know who heard about it  
364 first but (Shindell: Uhm-hmm.) probably I think – no, Brook Byers heard about it first.

365 **SHINDELL:** Oh, okay.

366 **ROYSTON:** So, Ted joined us as CEO and you know what makes a successful company  
367 is not just the technology or what I did or, it's bringing in the right managers. And, I'm a  
368 firm believer that you can't have a successful company without the, the best managers, like  
369 Ted Greene. (Shindell: Uhm-hmm.) Because, what it, you know [28:00] what Ted did?  
370 The first thing he did when he came in as CEO, and this is very important, is he, when he  
371 saw what we had, you know, we had the technology up and running, we could make  
372 antibodies, and we had, and we had hepatitis antibody so I, you know, I was pretty naïve.  
373 I'm just an academician. I said, "Okay, well we ought to compete with Abbott that had the  
374 monopoly on hepatitis tests. (Shindell: Uhm-hmm.) Let's compete with Abbott and we  
375 can come up with a better hepatitis test, you know." (Shindell: Uhm-hmm.) And, Ted  
376 Greene looks at me and he said, "Are you crazy? You don't go, you don't take your first  
377 product that you're going to bet the company on and go against Abbott. They're going to  
378 destroy you. Abbott is not going to give up their testing that easily and they'll destroy you."  
379 And he said, "We are not going to develop hepatitis testing. You," (Shindell: Uhm-hmm.)  
380 he says, he said to us and we now had a bunch of scientists there, he said, "You guys have  
381 got to come up with another product that we can develop as a lead product here, in the  
382 diagnostic space, because the therapeutic area of treating [29:00] cancer that's, that's years  
383 and years away." (Shindell: Uhm-hmm.) But the idea that Ted, and we all agreed with  
384 that Ted came up with, "Let's come up with a diagnostic strategy that can bring in near-term  
385 revenues because, you know, you don't need FDA approval for that." You just – well, you  
386 do to sell a diagnostic test you need to do some studies, but it's not like therapeutics.  
387 (Shindell: Right.) "Let's come up with a (Shindell: Right.) diagnostic test that we can sell  
388 to them, you know, based on these monoclonal antibodies to bring in near-term revenues

389 while we build our therapeutic program." And so, we're sitting around and I'm still acting,  
390 chief scientist, and I can remember the day we were sitting around with our little group  
391 around the tables, "What are we going to work on? What are we going to work on if we're  
392 not going to do hepatitis?" And one of the new people, it was Gary David, and you can  
393 certainly interview him. He was one of the, first scientists there. He said, "You know, I've  
394 been reading about this [30:00] new antigen called PSA, (Shindell: Uhm-hmm.) and it was  
395 discovered or developed, discovered and characterized in Roswell Park, and they claimed  
396 that it secreted in patients with prostate cancer and it might be a market for prostate cancer.  
397 Why don't we make an antibody to that and develop a test for prostate cancer? (Shindell:  
398 Uhm-hmm.) Maybe we could develop an early blood, early diagnostic test for men to  
399 pick up prostate cancer while it's still early?" We all said, "Hey, that's a great idea. Let's  
400 get some more information." And actually, that's what happened. The company said,  
401 'Yeah, this is a great opportunity. (Shindell: Uhm-hmm.) That's an untapped market."  
402 There was some interesting evidence that maybe that measuring PSA levels in the blood  
403 might tell you whether a man might have early-stage prostate cancer. (Shindell: Uhm-  
404 hmm.) So, we decided that's something we ought to explore. And so, somebody in the  
405 company went ahead and made a deal with Roswell Park [31:00] to license in that antigen.  
406 So we injected it into, this PSA antigen that was discovered, injected it into mice, made the  
407 antibodies, developed tests, and sure enough – I'm jumping years now, several, a couple  
408 years – we were able to demonstrate in that we could pick up prostate cancer, (Shindell:  
409 Uhm-hmm.) and the PSA test ultimately became the most important new development in  
410 prostate cancer, because all men over age fifty get the PSA test today, and I just got mine  
411 last week, for prostate cancer, picking up early, a lot of men have been diagnosed with

412 prostate cancer because of that blood test. (Shindell: Uhm-hmm.) And, that's another long  
413 story about whether that's useful or not, , but it's a very, very common test today and that  
414 was developed by Hybritech by our team. So, of all the things that Hybritech ultimately did  
415 contribute to society, was the development of that test. They did make other tests as well,  
416 pregnancy tests, CEA test for colon cancer, (Shindell: Uhm-hmm.) but the most important  
417 [32:00] test for society, was the PSA test for prostate cancer. Interestingly, Abbott  
418 laboratories ultimately developed their own. (Shindell: Uhm-hmm.) Because, they were  
419 the number one diagnostics test maker in those days. So, here's a great example of how  
420 having somebody out of industry who understood, strategically, that you don't bet your first  
421 product and compete against a giant in the field but go after something new paid off.  
422 (Shindell: Uhm-hmm.) Hybritech went public in 1981 and by, and then, at \$11 a share,  
423 when there was a public market, you see, (Shindell: Uhm-hmm.) for it, and then by 1982  
424 did another public offering at \$22 a share, (Shindell: Uhm-hmm.) and ultimately was  
425 acquired by Eli Lilly. And that story relates to the fact that, that even though we had this  
426 diagnostics business we knew that long-term the real value for the company lay in  
427 developing therapeutics, [33:00] but we also realized that it would take a lot of money.  
428 And, I remember Tom Perkins coming in one day and, he was on the board, and said,  
429 "What if I could get you a pharmaceutical, a pharmaceutical company to come in, acquire  
430 the company, but at least, and leave you guys to be sort of semi-independent to continue the  
431 work but you'd have all that money from the pharmaceutical?" And, that led to the  
432 acquisition by Eli Lilly, which took place in 1984 or five. (Shindell: Uhm-hmm.) And  
433 that's what happened. We were acquired by Eli Lilly.

434           Okay, so I've just described for you what I consider the, you know, the birth of the  
435 industry, because Hybritech was the first biotech company in San Diego. (Shindell: Uhm-  
436 hmm.) Now, me personally, I want you to understand that, oh, I, even though initially I  
437 was the chief scientific officer by, so once Ted Greene was there he wanted to hire a  
438 permanent chief scientist (Shindell: Uhm-hmm.) to do it. So, he hired a guy named Tom  
439 Adams. (Shindell: Uhm-hmm.) He came out, [34:00] after a year of negotiations, so he  
440 probably came in about 1980 or so, or something like that, and came on board. And so, my  
441 role now was really one of being a consultant to the company and being on the Board of  
442 Directors, and I was focused, you know, I was still focused on my academic pursuits of, of  
443 using antibodies for treating cancer. And, and but working with Hybritech was helping me  
444 to some extent in that. So, so one, just on a sidelight then you need, one thing that's – it's  
445 interesting you're doing this for UCSD (Shindell: Uhm-hmm.) Library. But, you ought to  
446 know that in those days the idea that one of the faculty members would be involved with a  
447 company (Shindell: Uhm-hmm.) [35:00] was not, not mainstream. (Shindell: Right.) It  
448 was actually looked down upon, to some extent. People started asking questions about my  
449 involvement with Hybritech.. They asked "Well, how can he do that? (Shindell: Uhm-  
450 hmm.) How can he be a full-time member of the UCSD faculty and at the same time start a  
451 company?" (Shindell: Uhm-hmm.) Well, the fact of the matter, and it all goes, the answer  
452 to that is because of the twenty percent rule that all faculties have around the country and  
453 university is that you're allowed to use twenty percent of your time (Shindell: Uhm-hmm.)  
454 to consult for other companies, and there was no prohibition to getting stock, or fees.  
455 **SHINDELL:** Now, is, was your perception that they were upset over the additional  
456 income or was it maybe this sort of [36:00] image of, like, isolated ivory-tower science

457 being maybe corrupted by working outside as well? Sort of breaking down that wall  
458 between (Royston: Right.) academia and industry?

459 **ROYSTON:** This ivory-tower concept was already breaking down because there was this  
460 class distinction between what we call "basic scientists" and "clinical scientists." (Shindell:  
461 Uhm-hmm.) I was always considered not a basic scientist but a translational scientist, so I  
462 always felt that the basic scientist, the ivory-tower basic scientist who do pure science  
463 always looked down upon me. (Shindell: Uhm-hmm.) And, that's a whole other story,  
464 because there was also, at UCSD in those days, you had the basic scientists on campus in  
465 La Jolla and you had the clinical scientists downtown. We were even separated. (Shindell:  
466 Uhm-hmm.) No, it was much more, "Wait a minute. Ivor started a company and he's got  
467 all this stuff? How could he do that and still be on the faculty? (Shindell: Uhm-hmm.)  
468 How did he do that? Is that legal?" you know. (Shindell: Yeah.) [Laugh] Well, the  
469 answer is yes, it's legal. Yes it's, [37:00] there is the twenty-percent rule, that a faculty  
470 member could consult for other companies twenty, up to twenty percent of his time.  
471 (Shindell: Uhm-hmm.) So, on a legal basis, what I was doing was I was consulting for  
472 Hybritech up to twenty percent of my time. So, there were no problem there. (Shindell:  
473 Uhm-hmm.) And, there were no rules that said that I couldn't have stock in the company.  
474 (Shindell: Uhm-hmm.) Or even if I spent time over at Hybritech I was allowed to do that,  
475 up to twenty percent of my time. (Shindell: Uhm-hmm.) And, any professor was allowed  
476 to consult for a pharmaceutical company or, any professor could consult for any company  
477 and that was a way, of course, to allow academics who had modest salaries, to boost their  
478 income by getting consulting fees. (Shindell: Uhm-hmm.) In my case, it wasn't so much  
479 the cash fees it was the equity that I got in the (Shindell: Uhm-hmm.) company that I was

480 consulting for. (Shindell: Uhm-hmm.) But, what happened is, there were a lot of secret  
481 meetings taking place at UCSD amongst the faculty. Like, "What do we do with Royston?"  
482 (Shindell: Really?) "How can he do this? There must be something [38:00] wrong." And  
483 those were the days when people looked, look down on commercial involvement. And they  
484 were, I mean, yeah a little bit, somewhat a ivory-tower mentality, but looking down on  
485 people, who were spending the time outside and benefiting from it. Of course, it wasn't  
486 really any different from any faculty member in any department who, (Shindell: Uhm-  
487 hmm.) who consulted for any company. But, this was different.

488 **SHINDELL:** Well maybe the – is it because the life sciences sort of were, you know, they  
489 didn't really have a tradition of that?

490 **ROYSTON:** That's right. There was no – it was not like the engineering school.

491 (Shindell: Right.) There was no tradition in life science, and you're absolutely right  
492 because all you have to do is look at where we are today. (Shindell: Uhm-hmm.) Today  
493 you're the exception in medical school if you're not consulting with somebody or not a  
494 founder of a company. Things over the past thirty years, have changed dramatically.  
495 (Shindell: Uhm-hmm.) I was there on the front line (Shindell: Uhm-hmm.)- in the  
496 beginning. So, as Brook Byers said, the famous quote when I complained to him about this  
497 situation, he said that, that "Herb Boyer, [39:00] the founder of Genentech, went through  
498 the same thing, to some extent," (Shindell: Uhm-hmm.) And, he was a professor at UCSF.  
499 Brook Byers's comment was, "Well, don't forget Ivor, pioneers always have arrows shot at  
500 them." [Laugh] And, and that's the answer to this dilemma. So, he was saying, "Look,  
501 you're the pioneer down here in San Diego. You're the first. You're going to have arrows  
502 shot at you," and that's what happened. I mean, it did also lead to, at one point, anonymous

503 letters being sent in to NIH asking them to investigate me because they (Shindell: Uhm-  
504 hmm.) just figured I was doing something wrong. And, they did do an investigation. They  
505 didn't find anything wrong. But, I always tried to be absolutely scrupulous about things.  
506 (Shindell: Uhm-hmm.) But, but I was investigated. And, these are the kinds of things that  
507 you had to put after , but now years later this is the norm now. (Shindell: Yeah.) So, I  
508 paved the way for all those that came later. I had to take some hits, (Shindell: Uhm-hmm.)  
509 but they were just emotional ones, people not wanting to talk to me in the hallway, things  
510 like that.

511 **SHINDELL:** Did you ever question what you were doing (Royston: No.) at this time?  
512 No?

513 **ROYSTON:** I always felt that what [40:00] I was doing was right. But remember, my  
514 goal all the time was, "How do I get this stuff into patients? (Shindell: Uhm-hmm.) How  
515 do I treat patients?" I was not in it for the money. I didn't start Hybritech, "Oh, I've got this  
516 great technology. I want to make a million dollars." No. It was, "We've got to start this  
517 company so I can make the antibodies so I can get them into patients so I can test them to  
518 see if these antibodies will be a new treatment for cancer." That's what (Shindell: Uhm-  
519 hmm.) it was all about. So, but now over the years developed, having worked with people  
520 like Brook Byers and other business, and venture capitalists and understanding their  
521 business more and developing a respect for what they did, ultimately I think when you get  
522 older and maybe you realize that you're not going to be getting the Nobel Prize, like Roger  
523 Tsien just got at UCSD, [43:00] someone like me would rather work as a venture capitalist  
524 helping other creative scientists be successful , I decided (Shindell: Uhm-hmm.) to start, I  
525 decided to move in that direction and to become a venture capitalist, (Shindell: Uhm-

526 hmm.) which I started that process in 1990 but it didn't complete until about 2000 when I  
527 came here full-time. And even though I started this company with Stan Fleming, and I had  
528 voluntarily left UCSD to become the head of the Sidney Kimmel Cancer Center, (Shindell:  
529 Uhm-hmm.) which I did until 2000.

530

531 Biogen Idec was an outgrowth from Hybritech. Once Hybritech was sold to Eli Lilly and I  
532 was still on my quest to use antibodies for treating cancer, I decided it was time to, to focus  
533 on a company that was really focused on treating cancer with antibodies, (Shindell: Uhm-  
534 hmm.) and I was able to convince 44:00 Kleiner Perkins and Venrock, another firm, to fund  
535 IDEC for the purpose of making monoclonal antibodies for treating lymphoma, cancer of  
536 the lymph system. And, and that was successful. And, the first antibody for cancer was  
537 Rituxan, which was approved by the FDA in 1997, even though we formed IDEC in 1985,  
538 about the time that Lilly was acquired. The same time that Lilly acquired Hybritech is  
539 when I formed IDEC. (Shindell: Uhm-hmm.) And, and IDEC became a very successful  
540 company here in San Diego.

541 **SHINDELL:** Uhm-hmm. You worked with Bill Rastetter there, is that right?

542 **ROYSTON:** Yeah. So, Bill Rastetter became the CEO. (Shindell: Uhm-hmm.) So,  
543 again, I teamed up with Brook Byers and then again for the second company, and then we  
544 needed to hire a CEO so we, it was Brook again that had heard that there was this really  
545 top-notch guy at Genentech, named Bill Rastetter, (Shindell: Uhm-hmm.) that may, maybe  
546 would be a good candidate to be CEO of the new company. 45:00 So, we interviewed Bill  
547 and then he got the job. Yeah. And, he became the CEO of IDEC.

548 **SHINDELL:** This isn't exactly a historical question but, you know, if you could take the  
549 you of today and stand next to the you of, you know, the early days of Hybritech, you  
550 know, do you think that your mentality now as a venture capitalist verses, you know, a  
551 scientific advisor or chief scientist, has that mentality changed? Would you have different  
552 ideas now, the person you are now versus who you were then? Is there a difference  
553 between a chief scientist (Royston: Well . . .) and a venture capitalist?

554 **ROYSTON:** Well, my chief scientist in a company or . . .

555 **SHINDELL:** Well . . .

556 **ROYSTON:** what I was back then was still an academic scientist.

557 **SHINDELL:** Right.

558 **ROYSTON:** I never was an employee in industry. I was an academic scientist trying,  
559 publishing papers, trying to discover new things, and particularly trying to develop new  
560 treatments for cancer using antibodies. (Shindell: Uhm-hmm. So . . .) That was my role  
561 at the university. I was 46:00 a full-time university (Shindell: Uhm-hmm.) faculty  
562 member. My goal was to cure cancer.

563 **SHINDELL:** So, I'm wondering if . . .

564 **ROYSTON:** So, if you say, my "you" of back then, me back then was focused on my  
565 science at UCSD. The Hybritech, or the IDEC, those were like sidelights for me.  
566 (Shindell: Uhm-hmm.) They were not my major goals. But, ultimately I, as I said I  
567 developed an appreciation for that, and over time I realized that the convergence of  
568 business and medicine was an, a way to accelerate (Shindell: Uhm-hmm.) discovery and  
569 to accelerate getting ideas into the clinic (Shindell: Uhm-hmm.) and into the market place

570 for the benefit of people. But an overarching goal as a venture capitalist is to make a good  
571 financial return for our investors. The two goals are really very different/

572 **SHINDELL:** I think that's what I was . . .

573 **ROYSTON:** As a university researcher I realized, "Boy, you know, you write all these  
574 grants 47:00 to do your science. You have to really love the science to do that, (Shindell:  
575 Uhm-hmm.) you know, building, doing small incremental studies to build on the science.  
576 It's a building block thing. And, and you write grants, and you get, you know, \$100,000,  
577 \$200,000 a year for your work, and so forth. But, there was something about being able to  
578 take millions of investment dollars and focusing it on somebody's science, (Shindell: Uhm-  
579 hmm.) where there might be some great innovation, and really creating something from  
580 nothing and moving, and developing a whole new technology or product area, like I had  
581 done with Hybritech and IDEC. (Shindell: Uhm-hmm.) But, at some, and so as I grew  
582 older I realized that the skill set that I had developed might be useful for others, (Shindell:  
583 Uhm-hmm.) so that I could play a role with the next Ivor Royston, you know, down the  
584 line, or the next person 48:00 who had a great idea. And with my experience I thought,  
585 once you realize that you're not going to get the Nobel Prize yourself, that you're not going  
586 to, that all you're going to do is – at one, if you believe that you're not going to make that  
587 big discovery that's going to really change the world [Laugh] then I felt that what I could  
588 do, I could play a better, a better role at doing, or at making a major contribution (Shindell:  
589 Uhm-hmm.) by combining business and medicine. The combination, the joining of  
590 business and medicine is a way to really accelerate discovery and move things along much  
591 faster, and I could see that from my own personal experience and I decided that, that that  
592 would be something that I would like to do. (Shindell: Uhm-hmm.) So, I moved in that

593 direction over time to where I am today, which is what I do today, here at Forward  
594 Ventures. (Shindell: Uhm-hmm.)

595 I teamed up with Stan Fleming. So, when I was running the Sidney Kimmel Cancer  
596 Center I decided to leave the university because of all the bureaucracy and I wasn't 49:00 as  
597 concerned about long-term tenure, and I had the successes in Hybritech and IDEC. And, I  
598 decided that the opportunity to build my own cancer center, with the help of other people,  
599 and it turned out to be Sidney Kimmel, I was able to get to know Sidney Kimmel quite  
600 well, (Shindell: Uhm-hmm.) who's, was the owner of Jones New York, and made a major  
601 commitment to cancer research. So, we started the Sidney Kimmel Cancer Center in San  
602 Diego and we built that up very nicely. And, and at the same time I dabbled with getting  
603 involved with venture capital with my own money, and Stan Fleming joined me, and he  
604 said, "Let's build a real venture capital firm. I'll be the the business guy, "I'll do the  
605 work." And so, we did build a firm to where it is today. And then at, and then, back, as  
606 both this cancer center and Sidney and Forward Ventures were growing it became clear  
607 50:00 to me that I had to choose. (Shindell: Uhm-hmm.) And then it also became clear to  
608 me that choosing Forward Ventures is how I wanted to finish up my career because I  
609 evolved at the Sidney Kimmel Cancer Center as more of an administrator adjudicating  
610 fights between (Shindell: Uhm-hmm.) professors, or its faculty members who wanted more  
611 space and more money, and I really wasn't, I didn't feel like I was really moving the ball  
612 very far in the nonprofit area. I decided to pursue the venture capital model with Stan and  
613 spend full-time on venture capital, which I did starting in 2000. (Shindell: Uhm-hmm.)  
614 So, I've been full-time here at Forward Venture since 2000, so eight years, but, and part-

615 time since 1993 when Stan joined me to start the institutional Forward Ventures while I  
616 was still running the Cancer Center.

617 **SHINDELL:** Uhm-hmm. Now, I have a whole other set of questions that's (Royston:  
618 Right.) really more to do with the sort of the landscape 51:00 of San Diego biotech and  
619 what you've witnessed, you know, as the landscape has changed, or (Royston:  
620 Dramatically. Yeah.) as this situation of biotech startups has changed over the years? But,  
621 I know that you wanted to keep it under an hour, so maybe we can leave that for a follow-  
622 up (Royston: Yeah.) interview, if you'd like?

623 **ROYSTON:** Sure.

624 **SHINDELL:** Okay.

625 **ROYSTON:** I do, just to make a comment, that the landscape has obviously changed in  
626 the quarter of a century. (Shindell: Uhm-hmm.) You know, when I, when I started  
627 Hybritech there were no biotech companies here. There were no service providers, there  
628 was no nothing here. Everything came down from the Bay Area. Now, you have one of  
629 the top regions in the world for biotech. (Shindell: Uhm-hmm.) So, I'm really happy that I  
630 played some role in that. You know, I mean part of the first company. But, all those  
631 people – and, you know, it's a fantastic community and now we're in an environment  
632 where, where most medical scientists and professors enjoy being involved with biotech  
633 companies, (Shindell: Uhm-hmm.) and pharmaceutical, and it's an active effort by all of  
634 the university 52:00 administrators and program leaders to develop ties with industry, and  
635 the biotech community. So, everything's totally flip-flopped over the years. (Shindell:  
636 Uhm-hmm.) So, I feel like that's great. And, people understand the importance of the  
637 industry. The other thing is we went through an era in, in the '80s where NIH money

638 declined abruptly and people were scrambling for grants. We actually are in one of those  
639 eras right now, (Shindell: Uhm-hmm.) and because, and there were opportunities within  
640 the biotech industry, companies that had started to, to actually give out grants and so forth,  
641 and people understood that there might be opportunities to get money for their research,  
642 when there's more biotech activity. So, yeah, things have changed dramatically, and we can  
643 talk about that next time we meet. (Shindell: Okay.) And, that'll be good.

644 **SHINDELL:** All right. Great. Well, thank you very much for (Royston: Okay.) putting  
645 aside this time.

646 **ROYSTON:** Yeah. You can just schedule a time . . .

647 **END OF INTERVIEW**

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**The San Diego Technology Archive (SDTA)**, an initiative of the UC San Diego Library, documents the history, formation, and evolution of the companies that formed the San Diego region's high-tech cluster, beginning in 1965. The SDTA captures the vision, strategic thinking, and recollections of key technology and business founders, entrepreneurs, academics, venture capitalists, early employees, and service providers, many of whom figured prominently in the development of San Diego's dynamic technology cluster. As these individuals articulate and comment on their contributions, innovations, and entrepreneurial trajectories, a rich living history emerges about the extraordinarily synergistic academic and commercial collaborations that distinguish the San Diego technology community.