

- David Glanz: We all have hopes and dreams, but most of us aren't brave enough to risk everything in the hope that they come true.
- David Glanz: Dr Jim Aylward had high hopes for a piece of research which he thought could lead to a drug for skin cancer, and when his employer didn't agree, he took the ultimate gamble. He threw in his job and put his redundancy payment into his research. Today his drug is a worldwide success, good for patients and generating jobs here in Australia.
- David Glanz: Hello, and welcome to this podcast brought to you by the Australian Academy of Technology and Engineering. Jim's just been awarded the academy's prestigious Clunies Ross Award for innovation. I'm David Glanz, and today we're talking to Jim about his journey and how he's now helping others to start up companies and follow their dreams.
- David Glanz: Jim, let's start with the drug you invented. It's called Picato. What does it do?
- Jim Aylward: Picato is registered worldwide for the treatment of non-melanoma skin cancer, specifically actinic keratosis, sun-spots, a pre-malignant form of cancer in some cases.
- David Glanz: Okay, and is it proving effective?
- Jim Aylward: It's very effective. It's something like 85% effective over many patients that have been treated now. We don't see the drug too much in Australia because it's not on the free list, but it's been very successful worldwide.
- David Glanz: I understand we've got your mom to thank for pointing you in the right direction on all this, so what's the story here?
- Jim Aylward: Yes, my mother was born in Victoria in Rutherglen. In Rutherglen, she saw older people who had disfiguring skin cancers and wanted to make sure that didn't happen to her. She was always looking out for home remedies.
- Jim Aylward: In the Sun Herald, in Melbourne, was published an article alluding to a letter in the Medical Journal of Australia talking about an old farmer who treated a confirmed basal cell carcinoma on his chest with the sap of a plant, went away and then came back, and they biopsied the area again and found no cancer. This was in 1976 reported in the Sun Herald. My mother cut that article out, and I said, "Well one day, when I have time, I will have a look at this and see whether there's any verification to it."
- Jim Aylward: I read the article in the Medical Journal of Australia more carefully, and there they did not recommend this as a form of therapy at all, and that sat there from 1976 until when I began to look at it 20 years later.

- David Glanz: Wow. And what did you find when you experimented with the sap?
- Jim Aylward: It was very interesting, David. My job was on the line at CSIRO. After 17 years of loyal service, things had changed, and so I thought now's the time, try the sap in a laboratory, defined laboratory setting, at the Queensland Institute of Medical Research, the Melanoma Genomics Laboratory. I got an introduction there.
- Jim Aylward: So I diluted the sap with sterile water so as not to frighten or confuse anybody, and went to the Melanoma Genomics Lab with this, and I saw Professor Peter Parsons there. He said, "Well, Jim, so you think you can cure cancer, right? Well here is malignant melanoma multidrug resistant form from a brain metastasis. You put your drug against these cells, we'll ring you, don't you ring us." So I said, "Well how long will it be before you get a result?" He said, "Oh, about four days."
- Jim Aylward: So, I went back to CSIRO. It was bleak for me at that period. My father had died of cancer a few years later and it looks as though everything was doom. Waited four days, heard nothing, waited a week, heard nothing, and then waited two weeks and I'd given up. But then after two weeks I got a phone call I'll never forget. "Jim, you better come in here quickly. We've just reviewed your cells. You appear to be turning the melanoma cells back to the appearance of a normal melanocyte," the cells from which melanoma is derived. In the trade it's called a differentiation agent, but we weren't sure whether the cells were normal. But at that stage, that was such a great piece of news for me.
- Jim Aylward: I ran out of the lab at CSIRO and yelled a big yahoo, and everyone thought I'd lost the plot, but that was then the beginning of a new life for me. I knew that I was going to try and pursue that activity that we saw to the bitter end, and that's the beginning.
- David Glanz: That's a tremendous story.
- David Glanz: I know the scientific trials, you can't just replicate it once, you've got to do it over and over again, but you felt very confident from that first test.
- Jim Aylward: Yes, the results were black and white that that dramatic change and shape of a limpet-like melanoma cell to a beautiful spindle melanocyte, which was lined up like a normal tissue would, I said well that can be the basis of a bioassay, and then from that I can then try and isolate the active principle by ... the terminology's called activity-guided fractionation, and find the active principle which was responsible for that amazing activity. So that's what I did.
- Jim Aylward: So I worked in the lab. I cut a deal with CSIRO that I could use their laboratory to work during the day doing the fractionation in the fume hood, and then at night I'd run back to the Queensland Institute of Medical Research where there were spare melanoma cells left over from their day's experiments.

Jim Aylward: I put my fractions against these cells and with Professor Peter Parsons he helped score the cells and look for that morphology change, and I learnt how to do that later on myself. But that's basically ... that was the schedule, trying to isolate the active principle.

David Glanz: You've told me in the past that your employer wasn't interested in pursuing this, even though you were clearly, even very early on, getting some impressive results. Why were you left on your own with this amazing discovery?

Jim Aylward: That's a good question, David. I was excited about that first result that I've just described to you, and went to the chief of the division and they said no they weren't interested. I was in a completely different field unrelated to what I was doing at CSIRO, and they said no. And I said, "Well, okay, if you're going to make me redundant, can I cut a deal with you? I won't complain after 17 years of loyal service, won't complain at all, if I could use the lab for six months, and only intellectual property from anything that arises." I guess they were getting jaundiced at that stage. They'd seen many people like me in the past.

Jim Aylward: Anyway, they said to me, "Well, Jim, yes, you can stay here, so long as you don't talk to anybody, don't use the library, and don't use the phones." That wasn't a problem. Mobile phones were just coming in. "And pay for every chemical you use." And I said, "Yeah, that's a fair deal. I'll do it." And so I was then using my redundancy money to fund that work, and it got to some pretty diabolical stages, but we persevered.

David Glanz: And it paid off, as you say. You obviously brought some bigger players on board to fund the research. As things progressed, you weren't just paying for it out of your own pocket. How did you convince commercial buy-in on your research?

Jim Aylward: That's a good question. The beginning was no one was interested in what I had. Everyone said it was too early. The conventional sources turned me down.

Jim Aylward: But I had a neighbor, who we'd met when our dog went walking, bumped into their dog, and the dogs got talking, and so did the neighbors, and Bill knew a gentleman well heeled from Sanctuary Cove at that stage. So Bill introduced me to Tony, and Tony put in a substantial amount of money to get me off the ground. He was prepared to invest in the wet behind the ears scientist who knew very little about business, and so that got us going and I'm grateful for that.

Jim Aylward: At that point in time, we applied for an Aus industry start grant, a Federal Government Aus industry start grant with matching funds. We were successful in getting that and that also helped to get us along the way.

Jim Aylward: Later on, the business angel got disillusioned. He got advice from his colleagues who said you don't know what you're doing. Why are you playing in this field? And fortunately, through another neighbor, who our dog had met another

neighbor through our dog, and he introduced me to a venture capitalist. The venture capitalist kept us going on the straight and narrow then, and a couple of years later we found that no other venture capitalists were interested, but because the work was going swimmingly well, we publicly listed. We went down that route. Eventually, there were 1600 shareholders who were investing in the Peplin story.

Jim Aylward: Many people have been touched by cancer, and it was just a lovely thing that these loyal shareholders invested and believed in the potential of the project. And in the end, some of the institutional investors jumped on board as well, and they gave creditability to the full project as well.

Jim Aylward: Finally, we survived the GFC. But just prior to the GFC, we got a lot of interest from an American venture capital company which put in a substantial amount of money, but also that attracted nervous Nellie Australian and institutional investors to invest as well, and I'm glad they did. They took the risk and got the reward.

David Glanz: That's a tremendous story. Obviously, one of the morals of the tale is any serious scientist needs a dog.

Jim Aylward: Absolutely. I couldn't put it better.

David Glanz: You took the research quite a long way onshore. I understand a lot of biomedical research, people come up with the original idea and then the testing phase goes offshore and out of Australian control. You took your testing through to phase three which is within two years of the product going to market. Can you talk me through that process?

Jim Aylward: Yes. That is, I think, so critical. I'm very proud of that fact. There were three phase three trials ongoing, testing for the effectiveness of the drug, how good it is in a therapy sense, and with large numbers of patients, 1500 from what I remember, it's an expensive business. But at each step, if you pass phase one, phase two, phase three, at each point there's almost like a quantum leap in the value of your company and your company can either go to feather duster or it can go really well, depending on how you get through those phases.

Jim Aylward: So, in that way, we value-added for our shareholders by getting a successful phase three, so we completed one phase three by the time Peplin was acquired by LEO Pharma.

David Glanz: Change tack a little bit. You've been, obviously, a researcher probably for most of your professional life, and now you've become an entrepreneur, something that you've had to learn from scratch. What are your insights on how industry and the research world working better together? What would make a better outcome and a smoother outcome for people like you with great ideas?

- Jim Aylward: Oh, that's a very big question. I think from a researcher point of view, I think they must realize that the business industry runs on milestones, meeting your milestones, performance indicators and milestones. So, set conservative milestones and meet those milestones, and I think that's a critical thing to remember.
- Jim Aylward: The other thing is to remember is that they like to see total focus, and that means a one product company. The idea of having multiple products is great in theory, but in practice, in Australia at least, if your first product goes down, you're going to be struggling to get support for your second product, so it's focus, focus, focus.
- Jim Aylward: And on the business side, they've got to realize that for drugs, at least, it's a long haul. Slow and steady wins the race in this case, and so people who are patient ... Patient capital is required in this game. With that, many good things can happen.
- David Glanz: You've now started a company called Oncolin. You're offering mentoring to people who are new to the game. How does that work? Do you feel like you're giving back after the years of when you've been getting support yourself?
- Jim Aylward: Yes, I've certainly tried to do that, give back to the industry with mentoring for growth, mentoring for investment into Queensland. It's wound down a little bit now, but it was very active at one time. ilab Incubator, I thought incubators were about chucks, but no they're not, they're about ambitious young people in startup companies. I made lots of mistakes along the way, and I believe that I can then tell people, give them a few clues as to how to do it better, I hope, and that's what I've been doing along the way.
- Jim Aylward: Oncolin was started not as novel therapeutics for oncology. I was going to find another Picato, ingenol mebutate, but I found in the end that that was very difficult, so my little moral there is when you go for it you have narrow windows in time, really go for it and do your very best by what you have.
- Jim Aylward: I can tell you about my failures, and interesting failures for that matter in Oncolin, but the more interesting story is I'm now helping small startups get off the ground, getting a feel of what they will confront when they see business people.
- Jim Aylward: Business people want to know when they will get a return on their investments. That's the number one thing. They want to know your competitive advantage. How good are you compared to the competition out there? All these things are important to instill in the young entrepreneurs.
- David Glanz: Okay, finally you've been awarded a Clunies Ross Award. What that does mean for you?

Jim Aylward: To me, I'm very humbled and honored to receive such an award. Clunies Ross was one of the first people to get CSIRO off the ground, and despite my problems near the end of time at CSIRO, I think it's populated by magnificent researchers and scientists and just the cream of the crop. And I actually did contract work back to CSIRO in those days.

Jim Aylward: Look, there's a long line of illustrious, distinguished recipients of the Clunies Ross Award, and I'm just humbled to be in the line as well.

David Glanz: Well, Jim, you came up with the idea, with a bit of help from your mother, but I'm assuming, along the way, a multimillion dollar company and a successful drug launch takes a lot of people to make happen.

Jim Aylward: It certainly does, David. Once I was passed the business angel stage in my early work, which was solely me, and the wonderful people at QIMR Berghofer, when it got to the venture capital public listing stage, I was no longer Jack of all trades, master of none. We then employed specialist people in their own fields to help.

Jim Aylward: For example, the director of development, Dr. Peter Welburn, and I should never forget the board of Peplin, which were marvelous, who helped with the guidance and gave gravitas and credibility to Peplin, and the CEOs, Gary Redlich, Michael Aldridge, and then finally Tom Wiggans. They all did an excellent job at their point in time to get Peplin to where it was.

David Glanz: Thank you very much for your time, Jim.

Jim Aylward: It's my pleasure. Thank you, David.