
INVESTOR BRIEFING

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With Dr Paul Watt, CEO of Phylogica, and Nick Woolf, Non-Executive Director of Phylogica.

Background

Phylogica is an Australian based drug discovery company. It has developed unique libraries of peptide compounds, called phylomers, that are being accessed by international pharmaceutical compounds for the development of novel pharmaceuticals. The diverse nature of these phylomers, which have been sourced from ancient bacterial genomes, have the potential to provide potent active pharmaceutical drug candidates.

Topic: Update on Recently Signed Pharmaceutical Drug Discovery Collaboration with MedImmune (AstraZeneca) & New Business Model

MedImmune Deal

The CEO Transcript: Phylogica has just signed its second drug discovery collaboration in seven months with a top 10 global pharmaceutical company. In December last year you signed a discovery deal with Roche, and this week you announced a discovery deal with MedImmune, part of AstraZeneca. The total potential deal value is worth US\$98 million, excluding \$1.5 million in an upfront payment and contract research fees.

Congratulations on the deal. Can you tell investors more about the deal just announced with MedImmune?

Paul Watt: MedImmune is the biologics arm of AstraZeneca and Phylogica is a biologics discovery company. MedImmune has approached us in order to access our phylomer libraries of peptides as a source of new antimicrobials targeting bacteria which cause certain hospital-based infections.

The CEO Transcript: So under this deal, MedImmune will give you a target, you will develop peptide drug candidates against that target and you'll be forwarding those peptides to MedImmune over the next year or so, is that correct?

Paul Watt: Yes, but the target in this case is a particular bacterial pathogen.

The CEO Transcript: So how long have you been talking to MedImmune and what were the drivers behind the deal?

Paul Watt: We've been negotiating this particular deal for about six months, although we've been in dialogue with MedImmune for about a year. The reason MedImmune approached us is that we had already shown that our phylomer libraries could be used to discover potent antimicrobials against gram negative bacteria, which is the type of bacteria that MedImmune

is interested in. One of the bacteria is publicly known, *Pseudomonas aeruginosa*, which is (an) important (issue) in hospital-based infections such as catheter sites, burns, pneumonia, as well as infections of the lungs of kids with cystic fibrosis.

Nick Woolf: Pseudomonas is a hard to treat bacteria and it's subject to multi-drug resistance.

The CEO Transcript: Is there something about peptides or phylomers that make them suitable to treating this type of (bacterial) target?

Paul Watt: It's certainly true that the potential for resistance arising to a biologics therapy as opposed to a small molecule therapy is reduced. That's a technical issue to do with the large surface area occupied on the target by the biologic; it's easier for a bacterium to evade a small molecule inhibition than to evade a biologic inhibition which is one of the reasons why some of the large pharma companies have initiated programs to use biologics like peptides in approaching these tough-to-treat bacteria.

Nick Woolf: And they (MedImmune) came to us because we offer through our libraries some structural diversity and drug-like structures that are not accessible through other peptide libraries.

The CEO Transcript: Your peptides are derived from ancient bacterial genomes, is that relevant to the fact that you're looking at treating bacterial infections in this case?

Paul Watt: The part that's relevant is really the structural diversity and the stabilities that we can access for these structures that come from ancient bacterial genomes. These peptides have not evolved to have anti-microbial activity in the origin species, but the huge diversity of shapes in these libraries enables us to choose peptides which have exquisite specificity and bind to the targets in or on the bacteria to cause anti-microbial activity.

What is relevant is the fact that these bacteria have been diverging in evolution for billions of years. Many of the bacteria live in extreme environments like deep sea volcanic vents or geysers. Because they live in these extreme environments they have very stable proteins and very stable structures within those proteins. Phylogica can harvest these stable structures within these proteins to generate libraries of more drug-like peptides because properties such as thermal stability for example, are important features that you want in a drug-like peptide.

The CEO Transcript: So is this a unique potential drug compound library that potential partners can access?

Nick Woolf: Yes. And the uniqueness of our proprietary libraries has attracted the likes of MedImmune because they've been unable to find as suitable drug-like peptide structures against this specific target. And most of the other large pharma, who similarly have difficult targets that they haven't been able to find any decent leads against, come and talk to us to see if the structural diversity that we offer can address those challenges.

Paul Watt: They're looking for access to a peptide library enriched for drug-like properties. Because we offer the world's most structurally diverse peptide library, quite literally, because we have billions of peptides from thousands of distinct structural families, and because those structures have been pre-selected through evolution with drug-like properties like thermal stability and resistance to proteases, the pharma companies feel that screening our phylomer libraries is more likely to yield more drug-like molecules than screening libraries of effectively random combinations of amino acids.

The CEO Transcript: What can you say about the financial terms of the agreement just signed with MedImmune?

Paul Watt: What is public is that the deal involves a licence fee from MedImmune for access to the phylomer libraries. We are not transferring the libraries to MedImmune, but they are required to pay a licence fee of US\$750,000 for us to screen our libraries on their behalf and we will receive an additional US\$750,000 in committed research funding for a year.

Nick Woolf: So that's for us to do the screening (of our library for hits to their target). We're coming up with the leads that will be transferred to them. And there's a substantial profit margin on that funding.

Paul Watt: We hand over the leads that we discover to MedImmune and they take those leads through pre-clinical and clinical development.

The CEO Transcript: **And if a product is developed from this collaboration, Phylogica stands to receive US\$98 million?**

Paul Watt: In down-stream payments. The entire deal size would be US\$99.5 million if you include the US\$1.5 million guaranteed up front payments.

Nick Woolf: There are some early milestones in the form of pre-clinical payments, if the product successfully moves forward through pre-clinical development, through clinical development, through regulatory (clearance) and some sales targets which we think are eminently achievable, plus royalties (on sales).

The CEO Transcript: **How long do you think it'll take Phylogica to develop the leads?**

Paul Watt: Less than a year and the (whole) project plan lasts for a year.

Nick Woolf: This is the first deal where we've been able to disclose a little bit more about the structure of the arrangement. This is one target. We hope to repeat this deal structure multiple times with big pharma and with multiple targets with each pharma. We would hope that MedImmune and AstraZeneca will come back to us with other targets that they're having difficulty finding peptide leads to through their in-house work or their other partnerships.

Paul Watt: We've got a number of deals under foot. We believe this business is sustainable and we certainly feel that our technology is scalable so that we can handle the volume of deals we're expecting in the next couple of years.

Business Models

The CEO Transcript: **On the subject of business models, your business model seems to have changed over the last 12 months. Can you explain how and why that's occurred?**

Nick Woolf: What we learnt from discussions with large pharmaceutical companies is that the main interest in Phylogica lies in its phylomer libraries. We recognise that as the core asset of the company. It's certainly where we've put the emphasis into protecting the IP.

The new business model is about working on the pharma's targets rather than just targets that we've identified. Coupled with the financial crisis of 2008, where investors have clearly become more risk averse and the unpredictable time lines of commercialising our in-house pipe line was clearly a challenge in this financial environment, we felt that certainly the interest from big pharma – for us to screen our libraries against their targets – was an opportunity for us to generate near term revenue. This is a route for us to reach cash

sustainability by repeating the MedImmune deal multiple times with other parties, with exclusive individual targets.

The CEO Transcript: How is the recently signed MedImmune deal different to the deal you signed with Roche in December last year?

Paul Watt: It's a different structure. While I'm unable to disclose the financial terms, I can say that the deal with Roche has an option structure, (where) Roche has paid for an option to the technology. We've screened for Roche, to identify phylomer peptides which are capable of bringing larger molecules like biologics into cells. We're shortly going to be delivering the report to Roche and then Roche has a period to exercise that option that triggers a larger relationship with Roche.

The CEO Transcript: So is there more commitment with the MedImmune type deal?

Paul Watt: It's a different structure. There are two types of structures that have worked for companies like ours. One is an option-type structure (Roche), the other structure is a research FTE-based structure (MedImmune) to fund full-time equivalent (FTE) staff to screen, so a contract screening model. Both models have been shown to work and both allow access to downstream milestones.

Nick Woolf: I think the MedImmune deal is the model that we're focusing on going forward on the basis that it's so scalable with it being exclusive to a specific target and repeatable. The business model is essentially risk-free for us. We generate near term cash and then we have reach-through rights on the basis that our partner is successful, and there's no exposure for us to fund any of the down stream development.

Paul Watt: The other nice thing is that unlike standard biotech companies in Australia, where there's an enormous amount of investment in some programs before they receive revenue, in this case we're able to license the libraries for diverse target areas where there's no prior investment from Phylogica required and we can still access seven figures in licence and screening fees.

That's why our model is so scalable. We could screen for half a dozen companies in parallel with this model because we don't need to have any prior investment in developing a program of hits that we then try to license. We can start from scratch and screen our libraries against the targets which our pharma partners provide. At the moment we are investing in some improvements in our robotic capabilities which will enable us to screen even larger numbers of targets in parallel to handle more than a dozen deals simultaneously.

The CEO Transcript: With this type of a business model, is there the scope to develop a very successful company, and if so, can you point to other examples of successes using this type of model?

Paul Watt: What's nice about that model is that it's been shown to be a lower risk model by companies that have been very successful in generating large revenue streams consistently, companies like Galapagos and Morphosys, which have very successfully executed this particular business model. Just last year Morphosys and Galapagos generated 81 and 100 million Euros in revenue, respectively. Morphosys used this model to achieve profitability years ago, allowing them to organically fund the first clinical entry of an internal candidate early this year. We're even seeing smaller companies like the Swiss company Evolva which also did a Roche discovery deal in January this year. They were able to generate significant revenue of 19 million Swiss Franks with this type of business model.

Nick Woolf: And what we haven't talked about is the progressive deal making that this model allows. Once we've reached cash sustainability on the basis of this structure, where we're focusing on the near term revenue more than the down stream potential returns, the opportunity then is to move to more risk-reward sharing deals where we do take on a greater role through development, in return for a greater proportion of the reward including greater milestones and higher (product) royalty rates.

Increased Interest In Phylogica Technology

The CEO Transcript: You have completed two big pharma deals in the last seven months. Why do you think it is that major pharmaceutical companies are now becoming interested in your capabilities and what is it that's changed within the company that is promoting that interest?

Paul Watt: Well I think two things have changed. One is that we've changed the business model as you see and so now we're offering to screen the libraries for large pharmaceutical companies. We weren't doing that a few years ago.

The second thing that's changed is that our technology is much more highly validated now. We've validated the phylomer libraries in five different animal models of diseases, and we've shown that we can obtain very high affinity phylomer hits against these targets. And we've shown that the primary hits can work directly in animals at sensible doses without any subsequent need for lead optimisation or maturation of those sequences.

We've also shown that we're able to deliver the phylomers by non-injectable means. The ability to deliver biologics by means other than injection is a real asset and we've shown that intra-nasal administration of phylomers can be effective in animal models.

Nick Woolf: And this validation data comes from the fact that we have spent so many years working on in-house programs. The fact that we have progressed programs through to the stage of having pre-clinical data has given us the validation data.

The CEO Transcript: Have these libraries become better organised over the years as well?

Paul Watt: That's true too. We make eight to 10 new phylomer libraries a year. The libraries are continuously upgraded and we know that both the quality and quantity of hits has been improved with our new libraries. We also have libraries that are enriched for particular drug-like properties and so we feel that the library asset itself is continually improving.

The CEO Transcript: So are there potentially more deals in the pipeline?

Paul Watt: Absolutely. We're talking to several other large pharmaceutical companies. The three companies that we're talking to currently around subsequent deals are all top 10 pharmaceutical companies and these are late stage discussions.

Nick Woolf: So we would hope to close another couple of deals this year and to repeat this model, similar to the MedImmune deal.

Update On Roche Collaboration

The CEO Transcript: Can you update investors on the progress with the Roche collaboration?

Paul Watt: We're delighted with the progress on that collaboration. We were engaged to discover phylomers from our libraries which can go into cells and we're confident that we've delivered on this. We're delighted with the progress of that collaboration and we expect to be sending our report to them shortly.

The goal of the Roche collaboration is to use phylomers as transporters of biologic drugs into cells. The biologic drugs of Roche would be attached to a phylomer transporter to get them into cells, so that if we're successful, a range of the biological candidates of Roche directed against intracellular targets would be phylomer-based.

The CEO Transcript: Thank-you very much for your time.

Paul Watt, Nick Woolf: A pleasure.

Terms

Phylomer peptides – Proprietary peptides developed by Phylogica, that are fragments of proteins sourced from ancient bacterial genomes.

This is an edited record of interview conducted by The CEO Transcript with Dr Paul Watt and Nick Woolf.

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