PHYLOGICA

BREAKTHROUGH PEPTIDE THERAPEUTICS

**ASX ANNOUNCEMENT**

# *In vivo* success – peptide vaccine in Herpes Simplex Virus

- **Phylogica's immunotherapy (peptide vaccine) program takes a significant step forward by demonstrating differentiated *in vivo* (animal model) results**
- **75% of mice primed with a vaccination containing Phylogica's Cell Penetrating Peptide (CPP) had no detectable virus after being given the Herpes Simplex Virus (HSV)**
- **The vaccine containing Phylogica's CPP was the top performing treatment group across all experiments (including the 'conventional' CPP Tat)**
- **The result demonstrates that the out-performance of Phylogica's CPPs *in vitro* (in a test tube) translate to improved outcomes *in vivo* (in a living organism)**

**6 December 2018:** Phylogica is pleased to advise that it has successfully demonstrated the efficacy of a vaccine containing its CPP technology in an animal model of disease.

*Background*

The field of immunotherapy (using a patient's own immune system to combat a disease) is one of the most exciting and rapidly developing fields in drug development. Cell Penetrating Peptides have been described as 'highly promising tools to advance the field towards clinical success'[1].

Phylogica has been developing a peptide vaccine using our CPPs to harness the power of the immune system to fight a disease process. The CPPs deliver antigens that are unique to diseased tissues (viruses or cancer) to the body's immune system in order to provoke an amplified immune response against the diseased tissue. CPPs play a critical role in delivering these antigens inside immune cells to trigger a 'killer' T-cell response that is programmed specifically towards the antigen delivered by the CPP (ie. Targeted to the diseased cells).

*How does the CPP-vaccine work in the context of Herpes Simplex Virus?*

The concept is that the CPP delivers the HSV antigen into dendritic cells. The dendritic cells trigger an immune response (production of T-cells) directed specifically towards the antigen expressed on the virus (the same antigen that the CPP delivers to the dendritic cell). The more effective the CPP is in delivering the antigen to the inside of the dendritic cell, the greater the magnitude of immune response through production of a type of T-cell known as a cytotoxic ('killer') CD8+ T cell. These T-cells then seek out and kill the virus.

[1] Grau M, Walker PR, Derouazi M. Mechanistic insights into the efficacy of cell penetrating peptide-based cancer vaccines. Cell Mol Life Sci. 2018;75(16):2887-2896

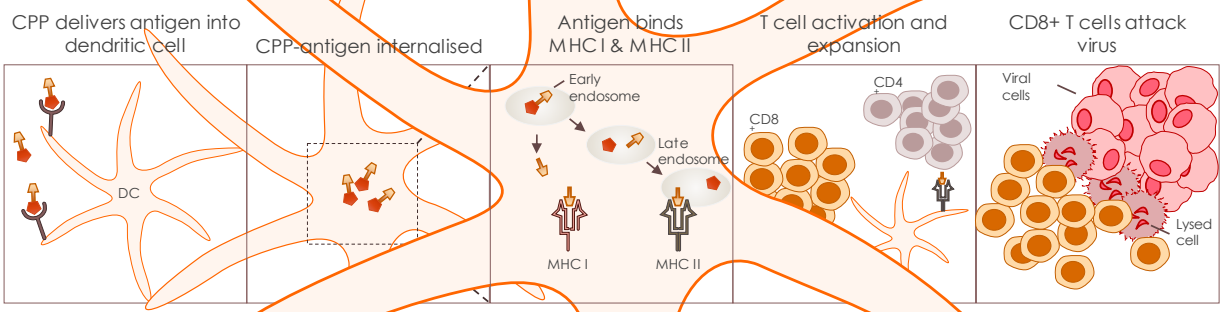


Figure 1: illustrati[illegible]e co[illegible]cept of a peptic[illegible]cine using a CPP to [illegible]r an immune response in d[illegible]c cells

The adva[illegible]ages of our CPP pl[illegible]form over con[illegible]onal CPPs have been well described *in vitro* and this outcome demonstrates that those ad[illegible]ages do translate from better outcomes in the test tube to better outcomes in a living organis[illegible]

*The results*

4 sets of experiments with three mice per group v[illegible]conducted (12 mice in each 'treatment' group and 9 mice in each 'control' group). Mice [illegible]vaccinated on Day 0 with either:

- treatment (CPP-antigen) + adjuvant (There v[illegible]e two separate treatment groups – one using Phylogica's CPP and another using Tat);
- antigen alone (no CPP) + adjuvant;
- adjuvant alone (no CPP and no antigen); or
- a negative control (no CPP, no antigen and no adjuvant)

Mice were then inoculated with HSV on day 7. Mice were culled on day 13 with tissue samples taken for completion of viral titre assays (measurement of viral burden within those tissues). The results of the experiment are displayed in Figure 2.

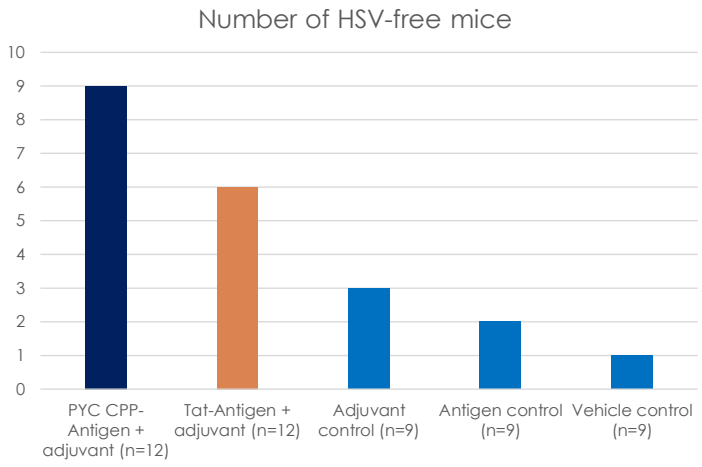


Figure 2: Demonstration of the number of mice in each group with no detectable virus in the tissue inoculated with HSV after tissue harvesting

*Next steps*

An animal model that is designed to provide a competitive assessment of the efficacy of Phylogica's CPPs when compared to Amal Therapeutics 'zebra' CPP is currently underway. Amal Therapeutics recently raised ~$50m at an undisclosed valuation to progress their peptide vaccine into clinical development in the setting of colo-rectal cancer. Results of this competitive evaluation (the first head to head assessment of Phylogica's CPPs against a commercially competitive product) are expected in the first quarter of 2019.

*Phylogica (ASX:PYC) is the owner of a peptide library containing the extraordinary richness and diversity of nature. We are using these libraries to develop a drug delivery platform capable of reaching the highest value drug targets located inside cells. Our delivery platform enables drug cargoes to cross the cell membrane and directly reach their target.*

**ENDS**

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**About Phylogica**

Phylogica Limited (ASX: PYC) is a biotech company focused on commercialising its intracellular drug delivery platform and screening its peptide libraries to identify drug cargoes for development against a wide range of disease targets. Phylogica controls access to the world's most structurally diverse source of peptides which have the ability to act as effective drug delivery agents and drug cargoes, penetrating cell walls to reach previously 'undruggable' targets across a range of disease types. Phylogica's platform of proprietary cell penetrating peptides has been validated across multiple animal models for the ability to deliver a diverse range of drug cargoes into cells. The company has collaborations with several pharmaceutical companies including Roche, Medimmune, Pfizer, Janssen and Genentech.

**Forward looking statements**

Any forward-looking statements in this ASX announcement have been prepared on the basis of a number of assumptions which may prove incorrect and the current intentions, plans, expectations and beliefs about future events are subject to risks, uncertainties and other factors, many of which are outside Phylogica's control. Important factors that could cause actual results to differ materially from assumptions or expectations expressed or implied in this ASX announcement include known and unknown risks. Because actual results could differ materially to assumptions made and Phylogica's current intentions, plans, expectations and beliefs about the future, you are urged to view all forward-looking statements contained in this ASX announcement with caution. Phylogica undertakes no obligation to publicly update any forward-looking statement whether as a result of new information, future events or otherwise.

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