

11 August 2011

# Phosphagenics Limited

## Improving the complexion

### Buy

**Market capitalisation:**  
A\$107m

**Share Price:**  
A\$0.11

**Price Target:**  
A\$0.32

 Sector: BBG AP Pharm & Biotech  
 RIC: POH.AX, POH AU  
 Priced at close 11 August 2011.  
 Source: IRESS

POH110811

POH's business is premised on the commercialisation of its Targeted Penetration Matrix (TPM™) transdermal drug delivery system. The TPM™ system facilitates the transport of small and large molecules across the skin barrier; and represents a versatile platform technology with potential applications across multiple products and markets. The company's lead product, a first-in-class oxycodone/TPM™ pain patch developed with partner 3M, should progress into Phase 2/3 clinical trials later this year. In addition to its pharmaceutical program, POH boasts an impressive revenue-generating cosmetics division that looks to be gaining momentum. We initiated with a Buy rating and a price target of A\$0.32

#### Key Forecasts

	FY10A	FY11F	FY12F	FY13F	FY14F
EBITDA (A\$m)	-11.3	-8.0	-7.5	-1.4	31.1
Reported Net Profit (A\$m)	-16.1	-11.1	-10.9	-5.7	26.4
Normalised Net Profit (A\$m) <sup>1</sup>	-16.1	-11.1	-10.9	-5.7	26.4
Normalised EPS (¢) <sup>1</sup>	-4.2	-2.9	-2.1	-1.1	4.6
Normalised EPS Growth (%)	nm	nm	-28.1	-47.7	-521.5
Dividend Per Share (¢)	0.0	0.0	0.0	0.0	0.0
Dividend Yield (%)	0%	0%	0%	0%	0%
Normalised PE (x)	-2.60	-3.77	-5.23	-10.00	2.37
EV/EBITDA (x)	-3.5	-5.9	-7.0	-41.8	1.1
Price/Net Oper. CF (x)	-3.2	-5.1	-6.2	-12.2	2.5

Source: Company data and RBS Morgans forecasts

#### TPM™ drug delivery system is a multi-market platform

POH's patented platform technology is a phosphorylation-based, transdermal (administered via the skin) drug delivery system. The Targeted Penetration Matrix (TPM™) technology enables the sustained, non-invasive delivery of small and large molecules across the skin barrier. POH's primary focus is to apply TPM™ for dermal and transdermal delivery of proven pharmaceuticals. The company has also established consumer cosmetic and nutraceutical divisions which develop other potential commercial applications of the TPM™ technology. Early sales of POH's cosmetic products are impressive and look to be gaining momentum; distribution deals with Sungate Supplies Pte Ltd will ensure that the Elixia® personal care range is launched in 300 stores throughout Asia later this year. Management expect that POH will be self-funded by 2013, utilising revenue from sales of the 'faster-to-market' personal care products to finance the development of the higher-value pharmaceutical projects.

#### TPM™/Oxycodone patch to begin phase 2/3 trials 4QCY2011

POH's leading pharmaceutical product is a first-in-class TPM™/oxycodone patch for the relief of moderate to severe pain. Oxycodone is not currently available in transdermal form and must be administered either orally or intravenously. Transdermal administration of oxycodone has several advantages over the existing alternative routes, including: a reduction in dose related side effects, the prevention of first-pass hepatic elimination and gastrointestinal degradation, improved patient compliance, and the minimised risk of abuse. POH has partnered with multinational conglomerate 3M to refine the patch, and will proceed with phase 2/3 trials later this year.

#### Investment View – Initiate with a Buy recommendation and price target of A\$0.32

Using a DCF valuation methodology we value POH at A\$0.32. Our valuation is most sensitive to the successful completion of clinical trials for the TPM™/ oxycodone patch.

#### Analysts

**Scott Power**  
 +61 7 3334 4884  
 scott.power@rbsmorgans.com

 RBS Morgans Limited  
 (A.B.N. 49 010 669 726) AFSL235410  
 A Participant of ASX Group

[www.rbsmorgans.com](http://www.rbsmorgans.com)

## Introducing Phosphagenics Limited (POH)

Phosphagenics (POH) is a Melbourne-based biotechnology company focused on the discovery of new and cost effective ways to enhance the delivery of proven pharmaceutical, nutraceutical and cosmetic products. POH's business is built around the application of its patented TPM™ drug delivery technology. The unique phosphorylation-based system enables dermal and transdermal delivery of pharmaceutical, nutraceutical and cosmeceutical actives.

POH has primarily focused its research efforts towards developing TPM™ for the delivery of existing pharmaceuticals. Their cosmetics division develops TPM™-based personal care products which are in department stores, TV shopping channels, and through the company's website. A third nutraceutical division uses TPM™ to improve the bioavailability and efficacy of orally delivered nutritional supplements. The company has collaborations with 3M, Calzada, CSL, Novartis Animal Health Inc., ISP, ProPhase Labs Inc., PharmaSynth, Myer, Pulse Pharmacies, Symbion Group and Terry White Chemists.

### Business model

POH's business strategy is focused on leveraging its platform technology to enhance the delivery of proven pharmaceutical, nutraceutical and cosmetic products. The route to market for POH's products is through partnering at the appropriate stage in a product's development, so as to maximise return on the company's R&D investment. POH will however aim to manufacture and supply the active ingredients to its partners or distributors where commercially feasible.

In order to attract marketing and development partners, POH conducts proof of concept studies in the laboratory and in the clinic to demonstrate the properties and viability of its products. POH is progressing towards a self-funding model and management expects that they will achieve this by 2013. Cash generated from the 'faster to market' personal care products will assist in funding higher-value pharmaceutical opportunities to a stage where a rewarding partnership/licence agreement can be negotiated.

### Key Technologies: TPM™ Transdermal Delivery System

Targeted Penetration Matrix (TPM™) was developed in-house and is a result of nearly 10 years of research and development. The technology employs a mixture of two tocopheryl (vitamin E) phosphates that is designed to enhance and improve the absorption of pharmaceuticals, cosmetic and dermatological actives. Transdermal drug delivery uses the skin as an alternative route to deliver systemically acting drugs. This method of administration has several advantages compared with the oral and intravenous routes. These include: the prevention of first-pass hepatic elimination and gastrointestinal degradation, predictable and extended duration of activity, sustained and controlled delivery, minimised side effects, improved physiological and pharmacological response, avoiding the fluctuation in drug levels, and improved patient compliance.

POH's core technology is built around the science of TPM™. The system utilises existing natural dermal transport mechanisms to transport small and large molecular drugs across the skin without disrupting or damaging its surface. While the exact mechanism by which the TPM™ nanoparticles operate to increase absorption is still being investigated, POH has a vast body of experience and data describing how various formulation parameters may be used to control the rate and depth of delivery of molecules.

Traditional transdermal drug delivery methods rely on physical disruption of the skin to allow the drug to pass into the bloodstream. By contrast, POH's technology is based on the following three processes: 1) phosphorylation - the addition of a phosphate molecule to the compound; 2) complexation - the reaction of the phosphorylated compound with another compound to form an association; and 3) enhancement - improving delivery of an active compound through the use of a phosphorylated carrier. POH has developed two systems for the transdermal delivery of drugs:

- **TPM-01 Delivery System** -The TPM-01 delivery system can deliver a wide range of drugs that are up to 1,500 Daltons in size. In transdermal applications, TPM-01 works by forming an association with certain drugs and then (via a transport mechanism contained within the dermis) the associated TPM-01/drug is efficiently transported through the skin. Once the drug

has been transported across the skin, it disassociates from TPM-01. This efficient diffusion through skin creates a subcutaneous drug reservoir and it is this pool that then allows for a sustained systemic delivery.

- TPM-02 Delivery System** -The TPM-02 delivery system is a nanosphere carrier system, which is suitable for delivering both relatively small molecules as well as macromolecules up to 30,000 Daltons in size. Examples of the later successfully delivered to date include insulin (lispro and the hexamer) and fragments of the hormone PTH. TPM-02 is a multi-lamellar malleable vesicular carrier whose size can be tightly controlled. This allows TPM-02 to be formulated in a range of sizes, from nanometres to microns in diameter. With respect to transdermal delivery, due to the physio/chemical characteristics (i.e. the softness and malleability of the TPM-02 outer layer), these vesicles are able to pass through the tight junctions between skin cells and as such do not get deposited in the upper layers of the skin, such as the stratum corneum or the epidermis. Additionally, as this technology allows for the size of the vesicles to be controlled, the rate of diffusion through the skin (and as a result the systemic release rate) can also be controlled.

Some of the key attributes of POH's TPM™ system are summarised in the following table:

**Chart 1 : Key features and benefits of TPM™**

Features	Benefits
Can transport both small and large molecules	<i>Technology applicable to a wide range of drugs</i>
Tocopheryl Phosphate (TP) is found as an endogenous molecule in humans	<i>Natural and Safe</i>
Powerful penetration enhancer that does not disrupt or irritate the dermis	<i>Increased patient comfort and compliance, maintains skin integrity</i>
Allows for a sustained release of compounds from just one application	<i>Flexible dosage regimens, therapeutic levels maintained for longer</i>
Rapidly penetrates the dermis (less than 1 hour)	<i>Fast acting</i>
Cost-effective to produce	<i>Significant value add opportunity</i>

Source: Adapted from company presentation

## Core Business Units

POH has three core business units which focus on the application of TPM™ for pharmaceutical, cosmetic and nutraceutical products.

### Pharmaceuticals

The pharmaceutical division focuses on drug delivery and drug enhancement using its TPM™ technology. The vitamin E-based TPM™ system has attained GRAS (Generally Recognised as Safe) status in the USA and POH's pharmaceutical research efforts are directed towards enhancing delivery of drugs that are already proven to work. Therefore, there is significantly less risk related to POH's products progressing through clinical trials.

POH is currently developing TPM™-based products for the following six pharmaceuticals: Insulin - transdermal insulin providing diabetic patients with sustained release insulin over 8-12 hour period; Lidocaine - various forms of anaesthetic used for a variety of ailments, including temporary relief of rashes, stings, sprains, strains, bites, and burns; Diclofenac - a non steroidal anti-inflammatory drug used for sprains and is commonly marketed as Voltaren; Tretinoin - a topical treatment for acne also known as Retinoic Acid; an anti-psoriasis drug; and Oxycodone - a pain relief patch providing sustained release of oxycodone into the bloodstream.

### Key product: TPM™/ Oxycodone Patch

The main drug target for POH's TPM™ system is oxycodone, an opioid with global sales exceeding US\$3bn. Oxycodone is the drug of choice for the management of chronic pain in patients suffering debilitating diseases such as cancer and arthritis, but it is not currently available in transdermal form and must be administered either orally or intravenously. It is more potent than morphine but with fewer side effects, allowing it to gain favour amongst clinicians and patients worldwide.

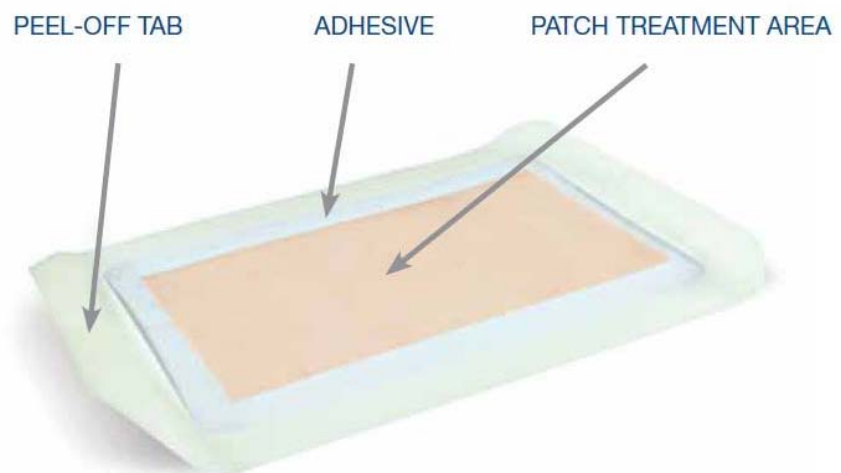
In 2009 POH conducted a series of clinical trials demonstrating that the TPM™ patch technology was able to deliver therapeutic amounts of oxycodone transdermally. In 2010 they conducted a further clinical trial designed to profile the performance of the patch under various dosing parameters. This milestone study, led by Professor Guy Ludbrook at the Royal Adelaide Hospital, involved 40 healthy subjects and was designed to quantify the concentration of oxycodone in the bloodstream following different treatment regimens; comparing the dose of oxycodone in the TPM/oxycodone patch and the duration of application. It found that daily application of the TPM/oxycodone patch again delivered therapeutic amounts of oxycodone into the blood, while an extended dosing period of 14 days enabled 'blood steady state' to occur. Despite their effectiveness, one of the key drawbacks for oral opioid pain medications is the inability to maintain constant levels of the drug in the bloodstream. This inability often leads to 'peaks and troughs' in blood levels, which result in 'breakthrough' pain and the need to further medicate patients. Transdermal delivery reduces the side effects associated with oral medication and potentially eliminates or substantially reduces the variability of the drug concentration in the bloodstream and therefore the occurrence of breakthrough pain.

The study conducted in 2010 also determined the effectiveness of a weekly TPM/oxycodone patch. The weekly patch provided constant levels of oxycodone for over seven days, producing blood levels suitable for less severe pain indications such as moderate back pain or post-hepatic neuralgia.

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**Chart 2 : TPM™/Oxycodone Patch**

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Source: Company Presentation

## **Partnership with 3M**

In November 2010, POH partnered with 3M Drug Delivery Systems to collaborate on the commercial manufacture and scale-up stages of the TPM™/oxycodone patch. 3M is a multi-billion dollar science-based company producing thousands of products in more than 65 countries. It has a focus on health care with products sold in nearly 200 countries.

The reasons to seek partnership before commencing phase 2/3 clinical trials were three-fold. First, a patch manufactured under tightly controlled conditions in a professional fabrication house is expected to have increased delivery and reproducibility than the lab scale patches manufactured internally by POH. The optimal finished product manufactured under GMP conditions would therefore be available for use in the critical Phase 2/3 studies. Second, the detailed chemistry and manufacturing dossier produced by 3M during manufacture would be available for submission to the FDA for a subsequent Investigational New Drug (IND). Thirdly, having the finished article allows POH to commit to rigorous toxicology studies now, with the knowledge that they will not have to be repeated in the future. The ability to aggressively pursue late phase clinical studies in parallel with both the FDA submissions and toxicology programs will fast-track the product and cut the time to market.

3M has been able to refine POH's original oxycodone transdermal patch prototype and has commenced the development of an improved version that will be used for next stage clinical trials. Collaboration with 3M has resulted in a 5 fold improvement in delivering oxycodone through human skin during in vitro studies. This should substantially improve the commercial prospects for the patch.

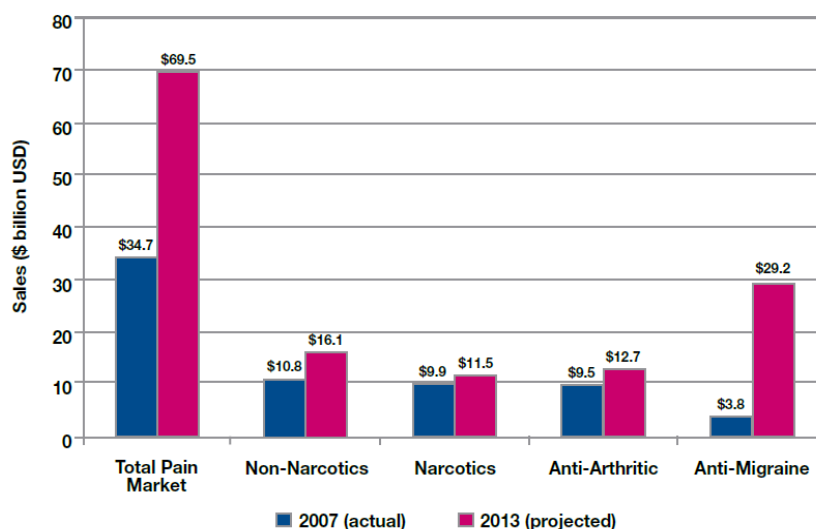
## **The global pain management market**

The total pain pharmaceutical market was worth US\$34.7bn in 2007 and is expected to grow to more than US\$69bn by 2013. The global pain market is comprised of four sectors – narcotics (opioids), non-narcotics (such as NSAIDs), anti-arthritics and anti-migraine drugs. In 2007, annual sales of the narcotics and non-narcotics sectors combined totalled more than US\$20.7bn with sales projected to increase to US\$27.6bn by 2013. Three of Phosphagenics' pipeline products – TPM/oxycodone, TPM/diclofenac and TPM/lidocaine – target these growing market sectors.

Growth in the market for pain drugs is driven by the following factors:

- demographic change such as an ageing population;
- increased awareness among patients and the medical, regulatory, and health insurance industry of the economic and medical need to treat pain;
- integration of pain management across physician specialties and a growing number of specialty clinics for the treatment of pain;
- advances in medicine which increase survival rates for patients with long-term illnesses, e.g. cancer, where chronic pain and/or breakthrough pain need to be managed; and
- improvements in surgical techniques for conditions, e.g. lower back pain, increasing the use of pain drugs in post-surgical settings.

Chart 3 : The Global Pain Market



Source: Company data (2010 Annual Report)

### The opioids

A distinct class of drugs, opioids act on neural receptors in the central nervous system. As they are the strongest form of pain drug, they are generally considered to be the gold standard in treatment.

While prescribed in the treatment of pain for more than 70 years, the first undisputed reference to poppy juice is found in the writings of Theophrastus in the third century BC. The word opium itself is derived from the Greek name for juice, the drug being obtained from the unripe seed capsules of the opium poppy plant, *Papaver somniferum*. The milky juice is extracted, and dried to make powdered opium, which contains a number of alkaloids. Only a few of these, like morphine, codeine, and papaverine are useful clinically. Opioids such as oxycodone and hydrocodone are derived from opium alkaloids.

There remains a significant need for new pain treatments with a reduced side effect profile. Despite the popularity and largely undisputed effectiveness of opioids, there are a number of well documented side effects, which mean the need for new approaches and therapeutics for pain treatment remain. These include:

- Significant side effect profile – There are a range of side effects associated with the use of opioids, including respiratory depression, constipation, headaches, somnolence (sleepiness), nausea, emesis (vomiting), cough suppression, miosis (constriction of the eye pupils), euphoria, dizziness, hypotension and respiratory depression. See Tables 6 and 7.
- Tolerance and/or physical dependence - Tolerance is the need for increasing doses of opioids to maintain a defined effect such as analgesia (in the absence of disease progression or other external factors). In contrast, physical dependence is manifested by withdrawal symptoms after abrupt discontinuation of a drug upon administration of an antagonist. Physical dependence and tolerance are not unusual during chronic opioid therapy.
- Potential for abuse – Given their potential for abuse, opioids are highly regulated drugs and closely monitored by the FDA, DEA (Drug Enforcement Agency) in the US and the TGA in Australia.

### TPM™/Insulin

POH is developing a product that aims to offer diabetics the world's first transdermally delivered insulin; providing patients with long-acting, sustained release insulin over an 8-12 hour period. TPM™/insulin will target Type 1 and Type 2 diabetic patients requiring regular glucose regulation by delivering a sustained insulin release to control and manage their diabetes.

POH has established safety and pharmacodynamic activity in healthy subjects in two Phase I studies and in Type 1 diabetics with one small-scale phase II study. These studies, which were conducted in collaboration with the Joslin Diabetes Center of Harvard Medical School, demonstrated significant reductions in blood glucose, endogenous insulin and c-peptide levels from a single application of TPM/insulin, with no irritation observed. In December 2009, POH announced that its scientists have:

- completed dose optimisation of the insulin formulation, substantially reducing the amount of insulin required to achieve therapeutic dose, and
- completed and tested the matrix insulin patch on animals, demonstrating that blood glucose levels were lowered for the duration of the studies.

POH is now reviewing commercial opportunities for this project.

#### **TPM™/Lidocaine**

Lidocaine is a well known topical local anaesthetic used for a wide variety of ailments, including temporary relief of rashes, stings, sprains, strains, bites, and burns. However it has poor penetration into the dermis, frequently rendering it largely ineffective. Global sales of topical local anesthetics in 2007 were US\$1.2bn.

POH's TPM™/lidocaine formulation is capable of improving the penetration rate and delivery concentration of lidocaine, while importantly, limiting systemic exposure. POH successfully completed a Phase 1 human clinical trial on the lidocaine product in 2008. This trial demonstrated that the TPM™ delivery system is able to increase both the depth of delivery of Lidocaine and the amount of Lidocaine delivered into skin compared to a leading marketed preparation.

#### **TPM™/ Diclofenac**

Diclofenac is a leading non steroidal anti-inflammatory drug (NSAID) widely used for sprains and strains and is commonly marketed as Voltaren®. Voltaren® is expected to achieve global sales revenues of US \$819m in 2010 for both oral and topical applications with a year-on-year growth rate of 9% from 2009.

A Phase Ib human study was completed in 2009 and demonstrated that the TPM™/diclofenac formulation results in more effective permeation of diclofenac into the skin than the currently available Voltaren® gel. The study showed that dermal absorption of diclofenac was increased compared with Voltaren® gel, while maintaining similar levels of systemic exposure.

#### **TPM™/ Psoriasis**

POH has entered into an agreement with a US private dermatology company to develop a prescription drug to treat psoriasis. The collaborator has received approval from the US Food and Drug Administration (FDA) for an Investigational New Drug (IND) application clearing the path to commence a Phase 1 clinical study in the US on the high value drug.

Psoriasis is a common chronic skin disease caused by rapid skin cell reproduction resulting in red, scaly dry patches of thickened skin. Psoriasis affects about 2 per cent of the population making it one of the most prevalent autoimmune diseases worldwide with over 125 million sufferers. POH has completed the formulation development of the new product that combines TPM® delivery technology with a known anti-psoriasis drug. In vitro studies demonstrated that this new formulation delivered the drug five times more effectively than a formulation not using the company's technology.

Under the terms of the agreement the dermatology company will pay for a Phase 1 clinical study in the US that will commence in the first half of this year. The study will evaluate the ability of TPM® technology to improve the delivery of the drug into the skin and increase product efficacy. POH has granted the dermatology company an option to license its technology for the anti-psoriasis drug which it may exercise after the completion of the Phase 1 study. If exercised, the dermatology company will conduct and pay for all clinical trials required to register the topical drug in the US. Additionally, it will pay POH milestone and royalty payments.

## TPM™/ Tretinoin

Tretinoin (also known as Retinoic Acid) is the topical treatment of choice for acne. However, it is poorly soluble and is associated with irritation and dryness of the skin. In the US alone the sales for topical acne treatments in 2006 were US\$1.3bn of which topical prescription retinoids, such as tretinoin, contributed US\$347m.

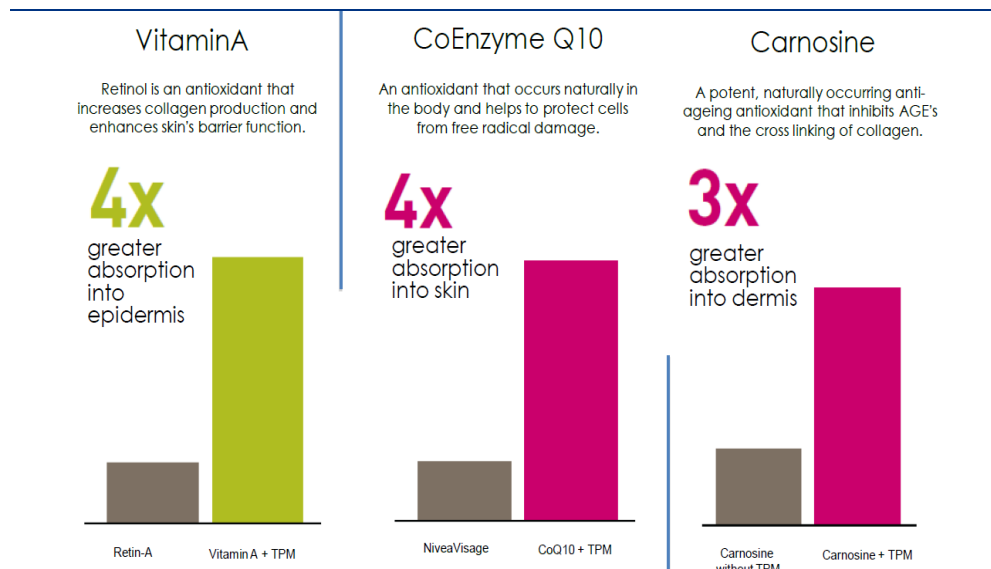
Pre-clinical studies demonstrated both an increase in dermal absorption of tretinoin when formulated with TPM™, and a significant reduction in irritation scores. POH also obtained favourable results in a phase I human safety and irritation clinical trial conducted in the USA. Currently POH has a large collaboration with a global leader in this dermatological field.

## Cosmetics

As a result of investment in pharmaceutical research and development, POH discovered that the TPM™ drug delivery platform had potential applications for skin care; and set about developing a high quality consumer cosmetics range that blended the science behind TPM™ with ingredients that are well known for their anti-ageing, moisturising and hydrating properties.

POH initially launched a Natural Anti-Ageing skincare range developed with natural multi-vitamin ingredients and patented TPM® technology, specifically chosen to hydrate and nourish the skin and fight the visible signs of ageing. The second POH range was a High Performance Anti-Ageing range. A third range comprised a cosmetic product developed for the body to assist the reduction of cellulite and subcutaneous fat.

**Chart 4 : TPM™ facilitated uptake of common cosmetic actives**



Source: Adapted from company presentation

## Key Product Range: Elixia®

POH announced the successful launch of the ELIXIA® BodyShaper Cellulite Contour Crème™ into selected Myer stores during May 2011. The launch of the novel anti-cellulite product in Australia's largest department store was an important milestone for the company.

BodyShaper includes the anti-fat peptide AOP9604 as well as two other lipolytic molecules, caffeine and forskolin. The product has been released following the completion of an 8-week international trial that has shown a marked reduction in the appearance of the cellulite at the application sites (up to 56% after 8 weeks).

## Distribution Deals

POH has signed an agreement with a leading Asian distributor ensuring its Elixia® personal care range will be available in stores across the Asia Pacific region by the 4QCY11. The milestone

distribution deal was struck with Sungate Supplies Pte Ltd, which will exclusively supply A.S. Watson & Co. stores, commencing in Singapore. A.S. Watson & Co. is a retail and consumer division of the Hong Kong based conglomerate Hutchison Whampoa Ltd, and over the past decade has become the largest health and beauty retailer in the world with over 7,000 stores. This deal reflects management's broader goal to expand their commercial divisions into Asia.

### **Hair care products**

POH has signed a non-exclusive license agreement with a prestigious New York hair care company operated by Rodney Cutler. Cutler, who left Australia almost 20 years ago, operates a leading chain of high-end US hair salons across New York and Miami and is affiliated with leading global hair care brands. The deal with POH enables Cutler to use the proprietary TPM® delivery technology to develop a new range of hair care products for the US, UK and Australian markets which account for over 15% of the global, \$67bn, hair care sector. Under the terms of the agreement POH will collaborate with Cutler to develop new formulations using its platform technology to target the delivery of active ingredients into the scalp. Cutler will be responsible for manufacturing, selling and distributing the products and will pay POH royalties on all sales.

### **Nutraceuticals**

Nutraceuticals is the use of vitamins and nutritious products to improve human or animal health. Phosphorylation of vitamins, nutrients and drugs improves their absorption into the body (orally or through skin) and also the biological activity. The nutraceutical division of POH is developing active ingredients for the following market segments:

- Human dietary supplements - eg vitamin capsules and tablets
- Animal dietary supplements - eg an all-natural feed formula for dairy cattle
- Functional foods and beverages - eg nutritionally enhanced foods

The route to market for POH's nutraceutical products is through partnering with companies that have established distribution networks within the relevant market segments. POH does not intend to become a direct marketer of products to consumers, and aims to manufacture and supply the active ingredients to its partners or distributors where commercially feasible.

**Human Nutrition** – POH's TPM™ delivery technology may be applied to dietary supplements aimed at improving oral bioavailability and efficacy of actives. In pre-clinical studies, TPM™ has been successfully used to deliver CoQ10, Omega-3 oils, lycopene and phytosterols. These products are amongst the most sought after dietary supplements available world wide. Results have demonstrated that TPM™ is able to significantly improve the absorption and bioavailability of these actives.

**Animal Nutrition** - Optimal nutrition in animals is crucial for the prevention and management of a range of diseases and conditions. TPM™ delivery technology is being utilised to enhance the benefits of key vitamins and trace elements in a range of animals including applications for production animals as well as domesticated animals and pets.

**Dairy Mastitis** - POH has partnered with dairy research company Mastitis Management Australia (MMA) to utilise its TPM™ delivery technology to deliver an all natural formula targeting mastitis in dairy cows, a condition which costs dairy farmers globally \$54bn per annum. The new technology will aim to improve the bioavailability of key nutrients, to supplement diets where antioxidant levels may be low. By targeting cattle susceptible to mastitis, this may provide a benefit as part of a natural holistic approach to control mastitis within the herd.

**Functional foods** - Research has shown that TPM™ can be incorporated into existing foods with minimal changes to the overall product. Examples include breads, juices, energy drinks, etc. This is a unique application of the delivery technology leveraging strong pre-clinical research into the capacity for the delivery technology to enhance bioavailability of nutrients. POH is currently assessing market opportunities in collaboration with potential partners.

## Research and Development: Product Pipeline

The following chart provides a snapshot of the projects that POH is currently involved with:

Chart 5 : POH R&D Pipeline

PRODUCT	TARGET APPLICATION	RESEARCH AND DEVELOPMENT	PRE-CLINICAL	PHASE 1	PHASE 2	PHASE 3
<b>Drug Delivery – Pharmaceutical</b>						
Insulin	Diabetes	[Phosphagenics Project]				
Insulin – Novartis Veterinary	Diabetes	[Phosphagenics Project]	[Collaborative Project for Commercial Partner]			
Oxycodone	Pain	[Phosphagenics Project]				
CSL Actives	Undisclosed	[Phosphagenics Project]	[Collaborative Project for Commercial Partner]			
Lidocaine	Pain	[Phosphagenics Project]				
Diclofenac	Pain	[Phosphagenics Project]				
<b>Drug Delivery – Dermatology</b>						
Retinoic Acid	Acne	[Phosphagenics Project]				
Undisclosed – US Dermatology Company	Dermatitis/Psoriasis	IND Granted			[Collaborative Project for Commercial Partner]	
Undisclosed – Global Dermatology Company	Acne	[Phosphagenics Project]				
PRODUCT	TARGET APPLICATION	PRODUCT DEVELOPMENT	MARKET DEVELOPMENT	COMMERCIAL PRODUCTION	LAUNCH	
<b>Cosmetic</b>						
ELIXIA®	Natural Anti-ageing	[Phosphagenics Project]				
ELIXIA® – High Performance Range	Anti-ageing	[Phosphagenics Project]				
ELIXIA® AOP9604	Body Sculpting	[Phosphagenics Project]				
Le Métier de Beauté – Peau Vierge	Anti-ageing	[Collaborative Project for Commercial Partner]				
Undisclosed	Undisclosed	[Phosphagenics Project]	[Collaborative Project for Commercial Partner]			
Undisclosed	Undisclosed	[Phosphagenics Project]	[Collaborative Project for Commercial Partner]			
<b>Active Delivery – Oral</b>						
Nutritional Supplements – Animal Feed	Antioxidants	[Phosphagenics Project]				
Nutritional Supplements – Dairy Cattle	Antioxidants	[Collaborative Project for Commercial Partner]				

KEY [Phosphagenics Project] [Collaborative Project for Commercial Partner]

Source: Company data

## Competitive position

The transdermal drug market is growing more slowly than the overall pharmaceutical market indicating a level of maturity and a lack of new approved products. The market for drugs delivered transdermally was valued at \$5.6bn in 2009 with the majority of these sales being accrued by products utilizing first generation patch technologies. Novartis was the leading company in the global transdermal drug market in 2009 with a market share of over 20%. Novartis' position was driven by both branded products such as Exelon patch and generics from its Sandoz subsidiary. Innovative technologies like POH's TPM™ system that are able to deliver drugs with a broader spectrum of characteristics are poised to revolutionize the transdermal drug delivery market and drive significant growth. Advantages of POH's products over its competitors include:

- The technology can be leveraged across multiple products and markets** - POH's TPM™ technology is applicable to a diverse range of drugs, cosmetic actives and nutritional supplements. It enables the sustained systemic delivery many different molecules - ranging from the relatively small (e.g. morphine, fentanyl, oxycodone, atropine, estradiol, testosterone) to large (e.g. insulin and PTH). Due to POH's licensing-based business strategy, the company is free to pursue numerous pipeline opportunities simultaneously.
- First-in-class drug delivery** - POH's TPM™/oxycodone patch will be a world-first system if it makes it to market. The product has several benefits over existing therapies and can take a significant share of the \$3.47 billion oxycodone medication market.
- Minimised risk of abuse** -.Oxycodone has a high abuse potential. Orally administered oxycodone is designed to be swallowed whole; however, abusers ingest the drug in a variety of ways. Oxycodone abusers often chew the tablets or crush the tablets and snort the powder. Because oxycodone is water soluble, crushed tablets can be dissolved in water and the solution injected. The latter two methods lead to the rapid release and absorption of oxycodone. POH's matrix-based patch system minimises potential for oxycodone abuse.

- **Sustained release delays onset of resistance** - TPM technology has the potential to deliver drugs that requires sustained blood levels and eliminates the problem of peaks and troughs of drug concentrations experienced with oral administration. It allows for a sustained release of compounds from just one application.
- **TPM™ is non-invasive and non-irritant** - A number of transdermal technologies have been developed which employ active delivery, in which the stratum corneum is breached to enhance the permeability of the skin. These active transdermal technologies include iontophoresis, electroporation, microneedles, abrasion, needleless injection, suction, stretching, ultrasound, magnetophoresis, radio frequency, lasers, photomechanical waves, and temperature manipulation. Many of these technologies irritate the skin. POH's passive vitamin-E based system employs natural dermal processes to transport molecules into or across the skin without irritation.

## Recent Newsflow

As with many life science companies, newsflow is important to driving the share price. The key share price drivers over the next 12 months for POH will relate to the results of the stage 2/3 clinical trials for the TPM™/oxycodone patch and the rollout of their personal care cosmetic range throughout Asia. Here is a summary of recent announcements from POH:

- In July 2011, Progen Pharmaceuticals Ltd (PGL) announced that the company's biopharmaceuticals manufacturing subsidiary, PharmaSynth Pty Ltd, had secured a new contract with POH. PharmaSynth was contracted to manufacture TPM® for Phosphagenics.
- In July 2011, POH signed an agreement with a leading Asian distributor ensuring its Elixia® personal care range would be available in stores across the Asia Pacific region by the fourth quarter, 2011. The milestone distribution deal was struck with the Sungate Supplies Pte Ltd, which will exclusively supply AS Watson and Company stores commencing in Singapore. A.S. Watson & Co. is a retail and consumer division of the Hong Kong based conglomerate Hutchison Whampoa Ltd, and over the past decade has become the largest health and beauty retailer in the world with over 7,000 stores.
- In June 2011, POH announced that they were on track to reach its million dollar sales revenue target by the end of July for its Elixia® range of Personal Care products. Phosphagenics CEO, Dr Esra Ogru, said more than 20,000 units of Elixia® – all containing the company's patented TPM® transdermal delivery technology – had been sold since the company launched three new cosmetic lines in April this year. "These sales results have exceeded our expectations and are further endorsement of the company's versatile platform technology," she said. The products were launched on the TVSN home shopping channel and online, before being made available in flagship Myer Retail Group stores in late May, and selected Pulse Pharmacies in June.
- In May 2011, POH announced that they were a step closer to commercialising its first-in-class oxycodone 'pain patch' following successful completion of initial formulation collaboration with global development partner 3M Drug Delivery Systems. 3M has refined Phosphagenics' original oxycodone transdermal patch prototype and will commence the development of an improved version that will be used for next stage clinical trials.

## Financials

- **Net cash position** as at 31 March 2011 was A\$8.5m. In March 2011, POH raised A\$7.5m in a placement of 83.9 million shares at 9 cents per share to institutional and professional investors.
- **Cash burn** – Cash burn in FY10 (y/e 30 June) of A\$8.3m.
- **FY10 result** – POH reported a FY10 net loss of A\$8.1m. Key items included revenue of A\$1.8m and employee benefits expense of A\$3.5m. Net operating cash outflow was A\$8.3m and cash at 30 June was A\$2.7m.
- **Capital Structure** - 823m ordinary shares and 14M options, with various expiring dates.

## Valuation and Price Target

We initiate coverage with an A\$0.32 DCF valuation on POH. We have set our price target at the same level, providing investors with 190% upside to the current price.

### Key Assumptions:

- **DCF based valuation inputs** – Our A\$0.32 valuation is based on a WACC of 14.47%, risk-free rate of 5.75%, risk premium of 7.0%, beta of 1.3x, and long-term growth rate of 4%. We have applied no value to POH's deep pipeline projects, providing further upside potential.
- **Cash position** – As at 31 December 2010, POH had A\$2.74m in cash. A further A\$7.6m was raised in a placement in March 2011. We have pre-emptively assumed a capital raising of A\$25m in FY12 which will be used to fund the clinical trials for the oxycodone patch.
- **Elixia® personal care range** - The personal care range is the main revenue raiser for POH while their pharmaceutical products are still in development. Within six weeks of their launch, the Bodyshaper and skincare range had sold 10,000 and 6,000 units respectively; and distribution deals for the products' rollout in Asia suggest that these initial sales rates could increase over the next 24 months. We have assumed a two fold increase in cosmetics sales by 2013 and a 5% ramping rate thereafter. We have assumed a sales price for the cellulite cream and skin care products of A\$99 and A\$69 respectively, with an 70% profit margin and a distributor mark up rate of 40%.
- **TPM™/ Oxycodone pain patch** – The oxycodone patch is set to commence phase 2/3 trials at the end of this year. If the trials are successful and the product passes FDA approval, we expect that the first units will hit the market in FY15. We have assumed that the patch will initially take a 10% share of oxycodone market (forecast to be worth A\$3.8bn by FY15), and assume that this share will increase incrementally to 30% by FY17. Details of a licensing deal for the patch are hazy, though considering similar licensing deals, we are assuming that POH will receive two consecutive A\$50m milestone payments in FY14 and FY15 on completion of the clinical trials, and 10% royalty payments from sales of the patch once it makes it to market. We have estimated that POH will spend A\$25m on clinical trials and a toxicology study.
- **Nutraceuticals** – The nutraceutical division of POH is not a core focus of the business. We assume that POH will receive A\$0.6m in revenue from licensing royalties and will spend A\$0.2m on R&D expenses.
- **Sensitivity analysis** – Our model is most sensitive to the success of the TPM™/oxycodone patch progressing through clinical trials. Our current model assigns a 40% probability of success to the upcoming phase 2/3 trials and we will adjust this accordingly as the program progresses. A 60% probability of success increases our valuation by 10cps, and the successful completion of the trials and FDA approval process will increase our valuation by a further 22cps. Changes to our modelling of the personal care range have a negligible impact by comparison. A sales price increase for the Bodyshaper cosmetics range of A\$10 results in a 1cps rise in valuation. If sales of the personal care range treble by 2013 our valuation will increase by 6cps.

## Risks

The typical risks that face all biotechnology companies at this stage of clinical development also apply to POH. Key risks will relate to the progression of the TPM™/oxycodone patch through stage 2/3 clinical trials which commence later this year. The funding risk associated with the trials is also acknowledged and the risk that additional capital will be required remains.

## Short Term Milestones

**Table 1 : Milestone events**

Date	Milestone
4QCY11	Operating lab based in Asia scheduled
4QCY11	Launch of cosmetic products into Asian, US and Indian markets.
4QCY11	Initiate Phase 2/3 clinical trials for TPM™/oxycodone patch
4QCY11	Submission of IND dossier to the USA FDA

Source: Company data

## Comparable companies

**Table 2 : Comparable companies**

Company (Exchange)	Platform (Description)	Market Cap	2010 Revenue
Acrux Limited Australia	Acrux Limited is a drug delivery company developing and commercializing a range of patient-preferred pharmaceutical products for global markets, using patented technology to administer drugs through the skin. Acrux's ACROSS®, MDTs® and Patchless Patch® form a platform technology with therapeutic applications for management of hormonal deficiencies, central nervous system disorders, contraception, pain and dermatological conditions. Its technology has a number of features that provide an improved form of therapy to patients including convenience of use compared with injections, tablets and patches; control of drug levels within the blood that minimize potentially toxic peaks or ineffective troughs; and reduction in the frequency of drug administration resulting from the slow release of the drug into the blood stream.	A\$610m	A\$55m
BioDelivery Sciences International Inc	BioDelivery Sciences International Inc is a pharmaceutical company that utilizes its novel and proprietary patented drug delivery technologies to develop and commercialize new applications of proven therapeutics. BioDelivery Sciences utilizes its patented and proprietary drug delivery technologies to create products and formulations that are targeted to significant market opportunities. Its drug delivery technologies include: Bioral® and Bema®. The company's Bema® drug delivery technology consists of a small bioerodible polymer film for application to mucosal membranes (inner lining of cheek) for transmucosal delivery of drugs for time critical conditions. Its Bioral® drug delivery technology encapsulates and protects the drug without chemically bonding to it and may facilitate oral dosing of drugs that typically need to be given by intravenous administration. BioDelivery Sciences' products based on Bema® technology are Onsolis® indicated for the treatment of breakthrough cancer pain; Bema® Buprenorphine indicated for the treatment of acute and chronic pain conditions; Bema® Triptan indicated for the treatment of migraine; and Bema® 5HT-3 Antagonist indicated for the treatment of nausea and vomitings. The company's Bioral® technology based product Bioral® Amphotericin B is indicated as an anti-fungal product for treating systemic fungal infections.	US\$109m	US\$3.4m
Aveva Private	Aveva Drug Delivery Systems is a Nitto Denko company that is dedicated to the development and advancement of transdermal drug delivery systems for selected industry partners. It offers technologies along with complementary resources for polymer and adhesive development. The company's mission is to bring drug delivery solutions to the healthcare community through selected industry partners. Aveva's crystal reservoir technology is based on the oversaturation of an adhesive polymer with medication, thus forcing a partial crystallization of drug. The presence of both molecular solute and solid crystal forms allow for a considerably higher concentration and consistent supply of drug in each patch. Its crystal reservoir technology has resulted in smaller patches with a more controlled and sustained drug release. The company's crystal reservoir system supports three patterns of drug release: sustained release, burst and chrono-controlled release. Aveva's therapeutic applications of transdermal drug delivery systems include: hormone replacement therapy (HRT), estrogen replacement therapy (ERT), cardiovascular, oral contraception, pain management, asthma/respiratory, smoking cessation/addiction medication, urinary incontinence/gastro-urinary, antiemetics, nutrition, cosmetics, sports medicine and immunization. It offers a full range of research, development, manufacturing capabilities using a number of sophisticated technologies to produce proprietary and generic transdermal drug delivery systems that fortify R&D pipelines and maximize the life cycles of products.	N/A	N/A
Noven Pharmaceuticals Private	Noven Pharmaceuticals Inc is a specialty pharmaceutical company engaged in the research, development, manufacture, marketing and sale of prescription pharmaceutical products. It is focused on psychiatry and women's health with an expertise in transdermal drug delivery technologies. The company is an indirect wholly-owned subsidiary of Hisamitsu Pharmaceutical Co., Inc. It was incorporated in 1987. Noven's business and operations are focused in three principal areas which include: transdermal drug delivery, the Novogyne joint venture with Novartis Pharmaceuticals Corporation and Noven Therapeutics, Noven's specialty pharmaceutical unit. It has developed DOT Matrix® technology, a third generation design which is a small, adherent and non-irritating. Noven's transdermal products include: Vivelle-Dot® (estradiol transdermal system) and Daytrana® (methylphenidate transdermal system. Both patches utilize its proprietary DOT Matrix® transdermal delivery technology. The company's oral products, marketed and sold by Noven Therapeutics, consist of Stavzor® (delayed release valproic acid softgel), Pexeva® (paroxetine mesylate) and Lithobid® (lithium carbonate).	N/A	N/A

Source: Company data; Thomson Reuters consensus estimates

## Board and Management

**Table 3 : Board and management team**

Person and Role	Description
Jonathan Addison (BEC (Tas), ASIC, CFTP (Snr)) Chairman and Independent Director	Mr Addison has over 30 years in the investment management industry, including wide experience in superannuation. Currently he is the Investment Manager (formerly Fund Manager) of the Meat Industry Employee Superannuation Fund (MIESF) whom he joined in June 1999 and where he is responsible for the investment management of MIESF. MIESF, a self-administered industry superannuation fund established in 1981 which operates nationally, currently holds 21,800,000 shares in Phosphagenics Limited. Prior to his appointment to MIESF, Mr Addison was a Director and Asset Consultant within the corporate finance section of PricewaterhouseCoopers and in this role was responsible for establishing an investment consulting practice with clients ranging from superannuation funds to insurance funds and funds managers. Prior to that, he was Manager Investment Consultant at Sedgwick Noble Lowndes. Mr Addison also holds Non-Executive Directorships with Austcorp Group Limited, Austcorp Funds Management Limited, African Enterprise Limited, African Enterprises New Zealand Limited, Hawksbridge Limited, Global Masters Fund Limited and TPCG Limited. Mr Addison is the Chairman of the Company's Audit, Compliance and Corporate Governance Committee.
Harry Rosen (BA, LLB) President & Chief Executive Officer	Mr Rosen is one of the founders of Betatene Limited and Denehurst Ltd, two formerly ASX-listed companies which commercialised significant research and development. Betatene is the world's largest producer of natural beta carotene. After the purchase of Betatene Limited by Henkel Corporation, Mr Rosen served as Vice President, Corporate Development. As a Vice President of Henkel Corporation, he worked for a number of years in the US in the nutrition and health care industries. Mr Rosen has consulted to many technology companies assisting them with the commercialisation of new technologies. He has had significant experience in the areas of seed capital raising, stock exchange listings, taxation and corporate law. Mr Rosen graduated from the Australian National University (BA-Psychology) and Melbourne University (LLB).
Esra Ogru (BSc(Hons), PhD) Chief Executive Officer	Dr Ogru was appointed Joint CEO of Phosphagenics in April 2010. Her responsibilities include involvement in setting strategic direction, management of operations and financing activities for the company. She also plays an active role in driving key commercial negotiations, development programs and corporate activity. She achieves this through strong leadership of an experienced pharmaceutical development team and strategic collaborations. Dr Ogru has many years experience in the pharmaceutical and biotechnology industries working in development and senior management roles. She has over ten years of experience in the management and coordination of pre-clinical and clinical development of pharmaceutical products.
Don Clarke Independent Director	Mr Don Clarke has been a partner of law firm Minter Ellison since 1988. He serves in the Melbourne Private Equity & Capital Markets group, predominantly advising ASX listed companies across a range of industries with emphasis on technology and manufacturing. Mr Clarke is also the Deputy Chairman of Webjet Limited and a Director of Circadian Technologies Limited. He previously served on the Board of Calzada Limited (formerly Metabolic Pharmaceuticals Limited).
Stuart James Independent Director	Mr Stuart James has held a number of high profile executive positions during his career and has extensive experience in the oil, health, pharmaceutical and financial services sectors. Following a 25 year career with Shell, both in Australia and internationally, Mr James past roles have included Managing Director of Australian Financial Services for Colonial Group and Managing Director of Colonial State Bank (formerly the State Bank of NSW). Mr James most recent executive role was as CEO of the Mayne Group, including Mayne Health and Mayne Pharma. He is a Member of the Supervisory Board of Wolters Kluwer NV and a Member of the Advisory Board of Gresham Private Equity Ltd. Mr James is Chairman of Pulse Health Ltd, Progen Pharmaceuticals Ltd, Prime Financial Group Ltd and a Non-Executive Director of Greencross Ltd.
Sandra Webb (BPharm, PhD, Dip Law) Independent Director	Dr Sandra Webb rejoins Phosphagenics, having served with the company as Pharmaceutical Development Advisor from February 2005 to June 2006. Dr Webb is a Director of Ground Zero Pharmaceuticals Pty Limited. She previously served on the Boards of AusBiotech Limited, Amrad Corporation Limited and Quintiles Limited. An experienced pharmaceutical professional, Dr Webb has a strong track record of achievements in the commercial world of drug development. As Managing Director of Quintiles Australia, she successfully grew the company as the leading commercial research organisation in Australia. Under her stewardship Quintiles Australia was the most profitable subsidiary of the worldwide Quintiles Transnational Inc. Dr Webb's research has been published in over 30 prestigious peer reviewed journals including the Journal of Physiology and the British Journal of Pharmacology and Nature. subsidiary, Gtech International Resources Limited.
Paul Gavin (BSc (Hons), PhD) Vice President, Research & Development	Dr Gavin is responsible for the global coordination and management of the company's pre-clinical and clinical research. Since joining the Company in 2002, Dr Gavin has developed opportunities in both the Company's pharmaceutical and nutraceutical divisions such as transdermal drug delivery systems and drug enhancement platforms for chronic pain management. He is an inventor of the TPM platform technology for transdermal delivery, and has managed its development from discovery to clinical development with a range of products. Dr Gavin holds a Bachelor of Science (Hons) and a PhD in Biochemistry & Molecular Biology from Monash University, Melbourne. He is experienced in many aspects of academic and commercial research and development and has published in peer journals.
Roksan Libinaki (BSc (Biomed) (Hons), PhD) Vice President, R&D - Nutraceutical	Dr Libinaki joined the company in 2002 and since this time has been involved and managed a wide range of pre-clinical and clinical development programs. Her focus has been on oral drug delivery systems and drug enhancement platforms to improved bioavailability and/or efficacy of a range of nutraceuticals and pharmaceuticals for the purpose of improving health and wellbeing. Dr Libinaki is responsible for the management of the Nutraceutical department. Dr Libinaki holds a Bachelor of Science (Biomedical, Hons) and a PhD in Biochemistry & Molecular Biology from Monash University, Melbourne. She has collaborated and overseen numerous academic and commercial research programs and has published in peer reviewed journals.
Divyang Butala (BSc (Hons), PhD) Vice President, Bioanalytical and CMC	Dr Butala joined the Company in 2009 and is responsible for the management of the Bioanalytical and CMC Department. He is also responsible for the smooth scale-up of products from the Chemistry laboratory to the Hallmarc manufacturing facility where the process is validated and locked-in. He has more than 15 years experience in Pharmaceutical industry - including R&D/QC Laboratory management, process development and scale-up of new drug candidates for clinical trials in Australia and overseas. During this period Dr Butala gained considerable expertise in preparing technical data packages for TMF, DMF and IND submission to TGA and FDA.

Source: Company data

**Table 4 : Scientific Advisory Board**

Person	Background
Dr William Hsu	William C. Hsu, MD, is a diabetologist, a clinical investigator, an Assistant Professor of Medicine at Harvard Medical School, the Director of the Asian Clinic and the Co-Director for the Asian American Diabetes Initiative at Joslin Diabetes Center, Harvard Medical School, in Boston. His research interests focus on developing and applying novel medical technologies for the treatment of diabetes. Dr Hsu has worked with a number of medical technology companies in the past, bringing clinical insight into product design, development and services. In addition, his research interests extend to understanding the causes of diabetes in Asian Americans. Dr Hsu received his medical degree from Mount Sinai School of Medicine in New York City, and completed his residence training in internal medicine at Yale New Haven Hospital. He completed his clinical training in endocrinology and metabolism at Beth Israel Deaconess Medical Center and Joslin Diabetes Center, Harvard Medical School. His undergraduate degree is from Cornell University. He has received teaching awards from Yale University School of Medicine and Harvard Medical School.
Professor Thomas Rades	Professor Rades is an international authority on drug formulation, he is the author of over 120 internationally peer reviewed journal articles and has received more than 50 grants equating to over \$4 million dollars. Professor Rades currently holds the position of Chair in Pharmaceutical Sciences, School of Pharmacy, University of Otago. He is a founding member of the European Association of Pharma Biotechnology and a member of the Australasian Pharmaceutical Science Association, International Association for Pharmaceutical Technology, Controlled Release Society, German Pharmaceutical Society and Microscopy New Zealand.
Dr Simon West	Dr West is one of Australia's leading inventors, with a strong background in industrial chemistry and inventions covering processes in mineral extraction, plastics recycling and production, food technology and natural health care products. With a 30 year career as an inventor of processes involving physical sciences, Dr West has had broad experience in the development of original solutions and the technical management of the resulting intellectual property for public companies. Dr West worked for 17 years with Kraft Foods Ltd on projects such as the modification of curd, 'magnetic carbon', automation of jar arrangement and a calcium ion sensor transistor. Dr West worked on filter aid regeneration and invented, developed and directed the beta carotene process that is now the basis for the commercial success of Betatene Ltd. Dr West invented the zinc tailings recovery process that was used as the basis for the public listing of Denehurst Ltd and was involved as Joint Managing Director in the implementation of that technology. He also invented the crumbing of PET forming part of the Renew process and was involved in building a pilot plant that was used as the basis for 'Innovations in the PET' which is now owned by Petrecycle Ltd. Dr West holds a Dip App Chem and BSc degree with a double major in chemistry and a DApp Sci (Honorary).

Source: Company Data

## Partners

**Table 5 : Key partners**

Partner	Description
3M	3M Co. is a diversified science-based technology company, engaged in serving customers and communities with innovative products and services. It is committed in actively contributing to sustainable development through environmental protection, social responsibility and economic progress. The company serves its customers through six business segments, which increase speed and efficiency by sharing technological, manufacturing, marketing and other resources. It was founded in 1902. 3M's business segments include Consumer and Office Business, Display and Graphics Business, Electro and Communications Business, Health Care Business, Industrial and Transportation Business and Safety, Security and Protection Services Business. Its Health Care Business provides medical, dental and orthodontic products, and drug delivery and health information systems. The company's technologies include: Adhesives; Abrasives; Light Management; Microreplication; Nonwoven Materials; Nanotechnology; Surface Modification etc.
Novartis Animal Health Inc	Novartis Animal Health Inc. is focused on the well-being of companion animals and the health and productivity of farm animals. Its extensive product range provides solutions for the prevention and treatment of various widespread animal diseases and parasite infestations. The company is a subsidiary of Novartis AG. Novartis Animal saves, and improves animal lives, both pets and farm animals. It researches, develops and brings to market treatments designed to meet the needs of pet owners, farmers and veterinarians. It is focused on the following therapeutic areas that include: arthritis, cardiology, dermatology, gastro-enterology, infectious diseases, and insecticides for farm fly control, nephrology, pain management, parasitology, performance enhancers and reproductive medicine.
Calzada Limited	Calzada Limited is a biotechnology company, which owns 100% of PolyNovo Biomaterials Pty Ltd and 100% of Metabolic Pharmaceuticals Pty Ltd which holds the AOD9604 intellectual property for the treatment of obesity and bone disorders. Calzada's PolyNovo owns and develops a suite of highly prospective biodegradable polymers that have potential applications across numerous medical fields. The group has license agreements and alliances with a number of the worlds leading medical device companies and also has joint venture and commercial arrangements with local experts in the areas of skin repair and cosmetic dermal fillers.
CSL Limited	CSL Limited is a specialty biopharmaceutical company that researches, develops, manufactures and markets products to treat and prevent serious human medical conditions. The company was incorporated in 1991, with an aim to identify, develop and commercialize important, new, biotherapeutic products that save lives by preventing or treating serious medical conditions. Its subsidiaries include: CSL Behring (formerly ZLB Behring), CSL Biotherapies, and CSL Biotherapies (NZ) Ltd. CSL's business units include: CSL Behring - provides plasma-derived & recombinant products, CSL Biotherapies - manufactures and markets biological products for human use, CSL Plasma and CSL biotherapies Immunohaematology - develops, manufactures and markets in vitro diagnostic products for immunohaematology and snake venom detection. Its product areas include: Pharmaceuticals to treat serious human medical conditions, Vaccines to induce immunity to protect people against a range of viral and bacterial diseases, Plasma-derived therapies to treat bleeding disorders, infections and autoimmune diseases, Antivenoms to treat victims of venomous snake and spider bites, and Diagnostics products to determine compatibility of donor-recipient blood in transfusion settings. The company's research & development activities are focused on new product development, life-cycle management and safety of its extensive product portfolio.
Phusion Laboratories, LLC	Phusion Laboratories, LLC is engaged in the development and marketing of over the counter products. It is a joint venture between Phosphagenics Limited and The Quigley Corporation. Phusion utilizes Targeted Penetration Matrix - TPM™ technology to create and distribute potent, targeted non-prescription remedies. TPM™ is a patient-friendly and cost effective system used to deliver proven pharmaceutical and nutraceutical products.
International Specialty Products (ISP)	International Specialty Products (ISP) is engaged in the development, manufacture and supply of innovative specialty ingredients that enhance product performance. The company is a supplier of specialty chemicals and performance-enhancing products for a wide variety of personal care, pharmaceutical, food, beverage and industrial applications. International Specialty's product categories include: Advanced Materials (Dosimetry), Agrochemicals, Beverage, Biocides, Elastomers, Industrial Products, Performance Chemicals, Personal Care, Pharmaceutical and Fine Chemicals. The company has developed proprietary technology and products for the effective delivery of agrochemicals. A broad range of ISP products are easily formulated as inert delivery ingredients in various agricultural formulations such as emulsifiable concentrates (EC), water dispersible granules (WDG), aqueous solutions, micro-emulsions (ME), micro-encapsulations, gels, flowable/suspension concentrates (SC) and wettable powders (WP).

Source: Company data

## Key shareholders

**Table 6 : Top 20 shareholders**

	<b>Name</b>	<b>Number held</b>	<b>% of issued shares</b>
1	Citicorp Nominees Pty Limited	85,973,666	10.44
2	Dalsey Pty Ltd <The Dalsey Super a/c>	6,377,323	0.77
3	Decoland Holdings Pty Ltd	5,500,000	0.67
4	Dr Esra Ogru	5,711,610	0.69
5	Ernest Szoke	5,084,270	0.62
6	Hsbc Custody Nominees (Australia) Limited	10,707,832	1.30
7	J P Morgan Nominees Australia Limited	47,566,232	5.78
8	Jogra Nominees Pty Ltd	49,684,658	6.03
9	Merrill Lynch (Australia) Nominees Pty Limited	52,069,503	6.32
10	Mr David Segal	5,378,666	0.65
11	Mr Ross Copeland + Mrs Gina Copeland I	21,093,771	2.56
12	Mr Ross Copeland + Mrs Gina Copeland II	8,236,227	1.00
13	Mrs Danielle Segal	5,378,666	0.62
14	National Nominees Limited	36,245,746	4.40
15	Paroha Nominees Pty Ltd	61,367,143	7.45
16	Rijem Nominees Pty Ltd	4,930,000	0.60
17	Superdes Pty Ltd <Superdes Super Fund a/c>	6,000,000	0.73
18	Tham Keng Chuen	5,555,000	0.67
19	UBS Wealth Management Australia Nominees Pty Ltd	5,962,308	0.72
20	Zahavette Pty Ltd <The Goldberg Super a/c>	15,027,372	1.82
	<b>Total</b>	<b>443,849,993</b>	<b>53.84</b>

Source: Company data – Annual report 2010 (DatAnalysis)

**Table 7 : Substantial shareholders**

	<b>Name</b>	<b>Number held</b>	<b>Percentage</b>
	Orbis Global Equity Fund Limited	120,049,981	14.58
	Harry Rosen	64,080,143	7.780
	West, Simon M	50,242,658	6.100
	NextGen PET Ltd	33,606,944	4.080
	Ingalls & Snyder LLC	33,460,149	4.060

Source: Company data – Annual report 2010 (DatAnalysis)

## Chart 6 : Financial Summaries

	AIFRS 2010A	AIFRS 2011F	AIFRS 2012F	AIFRS 2013F	AIFRS 2014F	AIFRS 2015F	Closing price (A\$)	0.11	Price target (A\$)	0.32	
<b>Income statement</b>							<b>Valuation metrics</b>				
Divisional sales	5.0	1.5	7.9	15.2	35.9	36.7	Preferred methodology		Val'n (A\$)	\$0.32	
Total revenue	5.0	1.5	7.9	15.2	35.9	36.7	<b>DCF valuation inputs</b>				
EBITDA	-11.3	-8.0	-7.5	-1.4	31.1	27.7	Rf	5.25%	10-year rate	5.25%	
Associate income	0.0	0.0	0.0	0.0	0.0	0.0	Rm-Rf	6.00%	Margin	2.0%	
Depreciation	0.9	0.3	0.4	0.4	0.4	0.4	Beta	1.45	Kd	13.95%	
EBITA	-12.2	-8.3	-7.9	-1.8	30.7	27.3	CAPM (Rf+Beta(Rm-Rf))	14.0%	Ke	14.0%	
Amortisation/impairment	4.1	3.0	3.0	3.0	3.0	3.0	E/EV*Ke+D/EV*Kd(1-t)		NPV cash flow (A\$m)	99.2	
EBIT	-16.2	-11.3	-10.9	-4.8	27.7	24.3	Equity (E/EV)	60.0%	Minority interest (A\$m)	-1.3	
EBIT(incl associate profit)	-16.2	-11.3	-10.9	-4.8	27.7	24.3	Debt (D/EV)	40.0%	Net debt (A\$m)	69.1	
Net interest expense	-0.1	-0.2	0.3	-0.3	0.0	-1.4	Interest rate	13.95%	Investments (A\$m)	0.0	
Pre-tax profit	-16.1	-11.2	-11.2	-4.5	27.8	25.6	Tax rate (t)	30.0%	Equity market value (A\$m)	31.4	
Income tax expense	0.0	-0.1	-0.3	1.3	1.3	1.5	<b>WACC</b>	12.5%	Diluted no. of shares (m)	97.3	
After-tax profit	-16.1	-11.1	-10.9	-5.7	26.4	24.2			<b>DCF valuation</b>	<b>\$0.32</b>	
Minority interests	0.0	0.0	0.0	0.0	0.0	0.0					
NPAT	-16.1	-11.1	-10.9	-5.7	26.4	24.2	<b>Multiples</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>
Significant items	0.0	0.0	0.0	0.0	0.0	0.0	Enterprise value (A\$m)	79.8	77.7	93.4	104.4
NPAT post abnormals	-16.1	-11.1	-10.9	-5.7	26.4	24.2	EV/Sales (x)	54.9	9.8	6.1	2.9
							EV/EBITDA (x)	-10.0	-10.4	-68.3	3.4
							EV/EBIT (x)	-7.0	-7.1	-19.6	3.8
							PE (pre-goodwill) (x)	-3.8	-5.2	-10.0	2.2
							PEG (pre-goodwill) (x)	-1.0	-0.3	-0.8	0.2
							<b>At target price</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>
							EV/EBITDA (x)	-1.18	-13.4	-72.0	3.7
							PE (pre-goodwill) (x)	-11.1	-15.4	-29.3	6.4
							<b>Comparable company data (x)</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>
							Biota Holdings				
							EV/EBITDA	-2.7	-12.2	2.6	0.9
							EV/EBIT	-2.3	-9.9	2.7	1.0
							PE	na	na	7.8	4.8
							Acruz				
							EV/EBITDA	7.1	9.6	6.1	3.7
							EV/EBIT	7.1	9.8	6.3	3.8
							PE	10.8	16.0	11.2	7.7
							<b>Per share data</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>
							No. shares	380.9	520.9	520.9	520.9
							EPS (cps)	-2.9	-2.1	-1.1	5.1
							EPS (normalised) (c)	-2.9	-2.1	-1.1	5.1
							Dividend per share (c)	0.0	0.0	0.0	0.0
							Dividend payout ratio (%)	0.0%	0.0%	0.0%	0.0%
							Dividend yield (%)	0.0%	0.0%	0.0%	0.0%
							<b>Growth ratios</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>
							Sales growth	-70.8%	444.1%	92.3%	136.3%
							Operating cost growth	-41.8%	62.8%	7.7%	-71.1%
							EBITDA growth	-5.6%	-77.6%	-77.6%	-1844.3%
							EBITA growth	-5.6%	-77.6%	-77.6%	-1844.3%
							EBIT growth	-4.1%	-56.2%	-56.2%	-682.6%
							NPAT growth	-1.6%	-47.7%	-47.7%	-561.1%
							Pre-goodwill NPAT growth	-1.6%	-47.7%	-47.7%	-561.1%
							Pre-goodwill EPS growth	-36.0%	13.2%	12.1%	12.1%
							Normalised EPS growth	16.2%	12.3%	12.3%	12.1%
							<b>Operating performance</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>
							Asset turnover (%)	0.7	4.0	7.4	14.7
							EBITDA margin (%)	-549.9	-94.5	-9.0	86.6
							EBIT margin (%)	-780.1	-137.5	-31.3	77.2
							Net profit margin (%)	-765.1	-138.4	-37.7	73.5
							Return on net assets (%)	-40.7	-29.8	-15.5	48.5
							Net debt (A\$m)	5.5	-4.8	-0.1	-22.7
							Net debt/equity (%)	19.9	-13.2	-0.4	-39.7
							Net interest/EBIT cover (x)	-69.0	32.7	-16.4	3607.2
							ROIC (%)				
							<b>Internal liquidity</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>
							Current ratio (x)	-6.2	3.5	0.1	44.6
							Receivables turnover (x)	6.9	20.6	16.0	17.1
							Payables turnover (x)	11.9	15.1	12.6	5.5

Source: RBS Morgans forecasts



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#### QUEENSLAND

BRISBANE – HEAD OFFICE (07) 3334 4888  
BRISBANE – EDWARD STREET (07) 3121 5677  
BUNDABERG (07) 4153 1050  
BURLEIGH HEADS (07) 5520 8788  
CAIRNS (07) 4222 0555  
CALOUNDRA (07) 5491 5422  
CAPALABA (07) 3245 5466  
CHERMSIDE (07) 3350 9000  
EMERALD (07) 4988 2777  
GLADSTONE (07) 4972 8000  
GOLD COAST (07) 5592 5777  
IPSWICH (07) 3202 3995  
MACKAY (07) 4957 3033  
MILTON (07) 3114 8600  
NOOSA (07) 5449 9511  
REDCLIFFE (07) 3897 3999  
ROCKHAMPTON (07) 4922 5855  
SPRING HILL (07) 3833 9333  
SUNSHINE COAST (07) 5479 2757  
TOOWOOMBA (07) 4639 1277  
TOWNSVILLE (07) 4725 5787  
YEPPON (07) 4939 3021

#### NEW SOUTH WALES

SYDNEY – HEAD OFFICE (02) 8215 5000  
SYDNEY – MACQUARIE STREET (02) 9125 1788  
SYDNEY – PHILLIP STREET - LEVEL 33 (02) 8215 5111  
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ARMIDALE (02) 6770 3300  
BALLINA (02) 6686 4144  
BALMAIN (02) 8755 3333  
CHATSWOOD (02) 8116 1700  
COFFS HARBOUR (02) 6651 5700  
GOSFORD (02) 4325 0884  
HURSTVILLE (02) 9570 5755  
MERIMBULA (02) 6495 2869  
NEUTRAL BAY (02) 8969 7500

NEWCASTLE (02) 4926 4044  
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ORANGE (02) 6361 9166  
PARRAMATTA (02) 9615 4500  
PORT MACQUARIE (02) 6583 1735  
SCONE (02) 6544 3144  
WOLLONGONG (02) 4227 3022

#### VICTORIA

MELBOURNE – HEAD OFFICE (03) 9947 4111  
MELBOURNE – FARRER HOUSE (03) 8644 5488  
BERWICK (03) 9796 2676  
BRIGHTON (03) 9519 3555  
CAMBERWELL (03) 9813 2945  
CARLTON (03) 9066 3200  
GEE LONG (03) 5222 5128  
RICHMOND (03) 9916 4000  
SOUTH YARRA (03) 9098 8511  
TRARALGON (03) 5176 6055  
WARRNAMBOOL (03) 5559 1500

#### ACT

CANBERRA (02) 6232 4999

#### SOUTH AUSTRALIA

ADELAIDE (08) 8464 5000  
NORWOOD (08) 8461 2800

#### WESTERN AUSTRALIA

PERTH (08) 6462 1999

#### NORTHERN TERRITORY

DARWIN (08) 8981 9555

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HOBART (03) 6236 9000

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