PITT STREET RESEARCH

Invion Limited

Improving cancer treatment

Share Price: $0.006

Invion Ltd (ASX: IVX) is a life sciences company developing Photosoft™ - a novel Photodynamic Therapy (PDT) for the treatment of various types of cancer and other medical indications. PDT technology generally uses a photosensitising compound and light to generate destructive reactive oxygen species (ROS) which kills cancer cells selectively and promotes an anti-cancer immune response. It has minimal side effects when compared to radiotherapy and chemotherapy with acceptable applications for diagnostic and therapeutic uses.

Targeting several multi-million-dollar markets

Invion is looking to develop its proprietary PDT technology Photosoft™ as a treatment against several cancers, as well as a range of other diseases. This significantly expands the addressable market opportunities for Photosoft™ to include multiple large and lucrative applications. For instance, preclinical studies yielded promising results for Photosoft™ in the treatment of multiple cancers, including Triple Negative Breast Cancer. Photosoft™ was effective at reducing tumour size, left no scars and may prevent the recurrence of the cancer (protective immunity). Further, IVX is undertaking tests to show that the technology could be effective against atherosclerosis and infectious diseases including viruses – such as Zika, Dengue and SARS-CoV-2; as well as bacteria and fungi – including the antibiotic resistant superbug MRSA.

Expanding market opportunities

IVX has a long-standing partnership with licensor RMW Cho Group to develop Photosoft™. This partnership has been expanded several times since its original iteration to cover development against further indications and eventual commercialisation in an increasing number of countries in the Asia-Pacific and North American markets. We outline these later in this report. Under the current iteration of the deal, IVX will have access to markets with more than 3.0bn people once commercialisation is achieved.

Valuation range of A$0.016 – A$0.021 per share

We value IVX at A$0.016-$0.021 per share using a probability weighted DCF approach. Although IVX's valuation has retreated from the highs of 2021, along with the broader biotech sector, we believe IVX has potential to re-rate as the clinical development of INV043 de-risks its future prospects. Please see page 25 for the key risks.

ASX: IVX

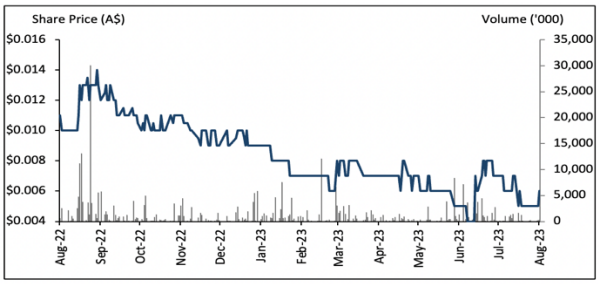
Sector: Pharmaceuticals & Life Sciences

24 August 2023

Market cap. (A$ m)	38.5
# shares outstanding (m)	6,420.1
# shares fully diluted (m)	7,205.9
Market cap ful. dil. (A$ m)	40.3
Free float	53.0%
12-months high/low (A$)	0.014 / 0.004
Avg. 12M daily volume ('1000)	1,380.9
Website	https://inviongroup.com/

Source: Company, Pitt Street Research

Share price (A$) and avg. daily volume (k, r.h.s.)



Source: Refinitiv Eikon, Pitt Street Research

Valuation metrics	
DCF fair valuation range (A$)	0.016–0.021
WACC	15.6%
Assumed terminal growth rate	2.0%

Source: Pitt Street Research

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Introducing Invion

Invion (ASX: IVX) is a life sciences company leading the global research and development of the Photosoft™ product portfolio, a Next Generation Photodynamic Therapy (NGPDT), for the treatment of a range of cancers, atherosclerosis and infectious diseases.

What is Photodynamic Therapy and how is it set to gain mainstream recognition in cancer therapy?

PDT is a therapy that utilises a photosensitising compound, oxygen and light for the generation of destructive reactive oxygen species (ROS). The main objective of PDT is to kill cancer cells selectively and to promote an anti-cancer immune response. PDT (generally) is FDA approved for the treatment of several cancer types and is an effective strategy for the ablation of tumour tissues. A few advantages of PDT include that it:

- Results in reduced or no scarring,
- Offers an alternative treatment option that helps in regression of tumours and long-lasting remissions
- Is less invasive compared to surgery; and
- Is less likely to have resistance develop

NGPDT is a ground-breaking PDT technology that addresses the drawbacks of current PDT technologies, such as off target toxicity, light sensitivity, and aims to bring about transformation of cancer treatment. It is minimally invasive and specifically destroys cancer cells while leaving the rest of the body's normal cells unharmed.

What is INV043 and why does it represent a promising new cancer treatment approach?

Leading drug candidate INV043 is effective in regressing multiple cancers in vivo, is non-toxic, safe and has limited side effects.

IVX's lead compound is the novel PDT photosensitiser INV043. INV043 is a NGPDT for the treatment of multiple types of cancers. It is part of the portfolio of Photosoft™ compounds and can be administered topically or intravenously.
INV043 is an improvement over previous PDT APIs (Active Pharmaceutical Ingredient) showing greater anticancer activity (potency) and enhanced cancer-targeting characteristics than the previous generations of APIs developed by IVX. Some of INV043's distinct advantages include that it is/has:

- active against multiple cancers,
- highly potent,
- selective for cancer tissues,
- a wide therapeutic window,
- strong theragnostic potential, and
- suitable water solubility.

INV043 has also shown to:

- be effective in regressing multiple cancer types *in vivo*,
- work additively with blockbuster immune checkpoint inhibitor (ICI) immunotherapy drugs
- stimulates the body's natural immune response, and
- is well tolerated with limited toxicity or side effects.

These observations support translation into successful clinical trials for a number of cancer types.

The original licensing agreement was expanded to new territories in the Asia Pacific region for development of the Photosoft™ technology.

What is IVX's commercialisation pathway with its products?

INV043 is potentially applicable across a range of cancers including skin cancer, ovarian cancer, anal cancer, T-cell lymphoma, Triple Negative Breast Cancer (TNBC), pancreatic cancer and colorectal cancer.

The development of INV043 is funded by technology licensor RMW Cho Group through an R&D services agreement.

In June 2021, IVX and the Cho Group entered into a co-development and license agreement, including exclusive distribution rights, to expand development of the Photosoft™ technology into the new disease areas of atherosclerosis and infectious diseases, in all Asia-Pacific countries excluding China, Hong Kong, Macau and Taiwan, the Middle East and Russia.

In November 2021, the original licensing agreement for cancer was expanded to include all countries in the Asia Pacific region excluding China (but including Hong Kong), Macau, Taiwan, Japan and South Korea. This was done with the objective of gaining access to markets with more than 2.8 billion people. Following the licence expansion, IVX raised A$12m through a placement of new shares to existing and new professional and sophisticated investors. Out of this raise, IVX paid A$5m to the Cho Group for development costs of the Photosoft™ technology. The remaining proceeds are likely to be utilised in the discovery program on atherosclerosis and infectious diseases, general working capital and operational costs and to cover capital raising costs.

Subsequently, in February 2023, Cho Group and IVX signed another agreement for the co-development of the Photosoft™ technology for atherosclerosis and infectious diseases to expand exclusive rights to also include USA, Canada and Hong Kong. IVX will make a payment of A$3.5m as a contribution to previous development costs invested by the Cho Group in the Photosoft™ technology pertaining to the newly expanded territories.

What has been IVX's pre-clinical experience with Photosoft™?

The collaborations between IVX and two leading research organisations, the Peter MacCallum Cancer Centre (PMCC) and the Hudson Institute (Hudson) focusing on the pre-clinical evaluation of INV043 has generated positive results. Favourable pre-clinical results include Proof-of-Concept (PoC) studies conducted against TNBC at Hudson. Additionally, the usage of INV043 in conjunction with immune checkpoint inhibitors (ICIs) displayed an improved effectiveness of 65% in mice having TNBC compared to standalone ICI therapy. Clear stabilisation and tumour regression were also achieved despite restricted treatment protocols. Successful *in vitro* tests were also conducted against SCCs associated with anal cancers at PMCC.

The COVID-19 pandemic had disrupted the sector and Invion was no exception. Specifically, Invion was previously preparing to take a prior anti-cancer candidate IVX-P03 to clinical trials and had undertaken significant pre-clinical work on that compound. Unfortunately, trials had to be put on hold due to the pandemic. Yet, Invion took the opportunity during this period to improve on its API and developed INV043, which has been shown to be far more potent than IVX-P03. However, this also meant that as a different API compound, all the pre-clinical studies including around safety and toxicity testing had to be repeated using INV043, which has resulted in delays to starting its clinical trial program.

On the infectious diseases side, in collaboration with Viroclinics, Photosoft™ compounds were found to be effective against multiple viruses including SARS-CoV-2 (Omicron and Delta variants), Zika and Dengue. Further, in conjunction with the Australian Centre for Antimicrobial Resistance Ecology (ACARE), University of Adelaide, Photosoft™ compounds were also found to

be effective against antibiotic resistant MRSA bacteria, *E. coli* bacteria and *Candida albicans* fungus. This demonstrates the broad spectrum potential of the Photosoft™ technology against multiple pathogen types. The World Health Organisation (WHO) has stated that anti-microbial resistance is one of the top 10 threats to humanity. Photosoft™ may provide an avenue to address this significant unmet medical need.

Of particular note, it is hypothesised by ACARE that bacteria and fungi may not be able to develop a resistance to Photosoft™.

"Given the general mode of action of PDT compounds, we surmise that it is unlikely for superbugs to develop resistance to the compounds which could be an advantage over other antimicrobial agents that have specific targets/sites of action," said Prof Darren J. Trott, Director of ACARE. "*This will be the subject of further investigation in resistance development experiments*."

Nine key reasons to look at IVX

1. **IVX's leading drug candidate for cancer using Photosoft™ technology (called INV043) has strong potential –** IVX's current product from the Photosoft™ technology is the novel PDT photosensitiser INV043. Substantial progress has been achieved by the company in the development of INV043, which is an improvement over previous PDT APIs. INV043 has exhibited improved anticancer activity and cancer-targeting characteristics than previous APIs developed by IVX. Its unique properties provide the company multiple avenues to value realisation for its shareholders.
2. **Photosoft™ represents an improvement over existing treatments for cancers and other diseases** – PDT generally has shown promise against cancer but has struggled to gain traction because existing treatments have numerous issues such as poor potency and off-target toxicity. Photosoft™ and INV043 are an improvement on existing PDT treatments. Preclinical studies have depicted that INV043 has greater anticancer activity and better cancer-targeting characteristics than previous generations of PDT, including the original Photosoft™.
3. **A clear clinical pathway exists for INV043 –** INV043 is on the pathway to participate as the best-in-class PDT in the oncology market. Cancer is the main focus of IVX as it prepares to commence Phase I clinical trials. INV043 has potential applications across various types of cancers ranging from skin cancer, ovarian cancer, T-cell lymphoma, TNBC, pancreatic cancer, ano-genital cancer, colorectal cancer and kidney cancer.
4. **IVX's partnership with the Cho Group will facilitate Photosoft™ development –** IVX has a long-standing development and licensing agreement with the Cho Group since 2017, giving it a key advantage over many other Life Sciences developers. The original deal has been expanded multiple times and currently covers Australia, New Zealand all Asia-Pacific countries excluding China, Hong Kong, Macau and Taiwan, the Middle East and Russia. It also covers the US, Canada and Hong Kong for infectious diseases. The current partnership also provides for Cho group to fund development activities for Photosoft™:
    - **For cancer**: 100% of development in Australia and New Zealand,
    - **For atherosclerosis and infectious diseases**: 75% of activities not directly related to clinical trials or commercialisation of the technology (including pre-clinical studies, research activities and all drug formation, manufacturing and GMP

compliance activities) and 25% of development activities that are related to commercialisation, including clinical trials, of Photosoft™. On top of all this, Cho will contribute its existing IP and know-how in relation to Photosoft™ for atherosclerosis and infectious diseases.

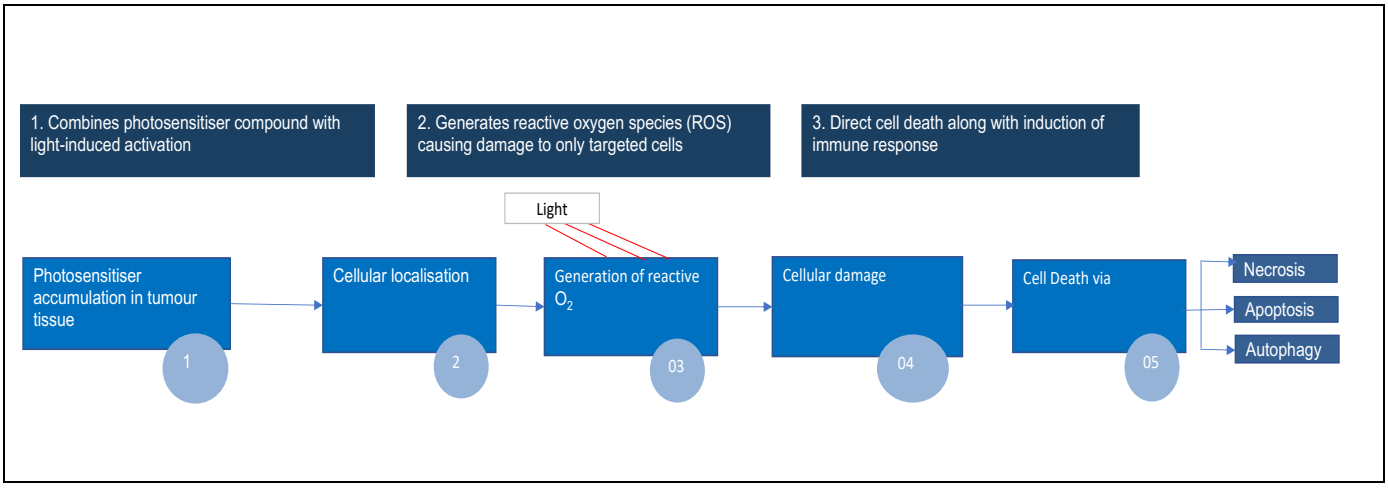
5. **The Photosoft™ technology has significant potential beyond cancer –** The PDT therapy has utility across a range of disease conditions beyond cancer. In June 2021, IVX negotiated the right for the development of Photosoft™ in atherosclerosis and infectious diseases in APAC (excluding the Greater China region, Middle East and Russia). In late 2022, IVX demonstrated *in vitro* the broad spectrum potential of the Photosoft™ technology against multiple pathogen types encompassing multiple viruses including SARS-CoV-2 (Omicron and Delta variants), Zika and Dengue. Further, in conjunction with the Australian Centre for Antimicrobial Resistance Ecology (ACARE), University of Adelaide, Photosoft™ compounds were also found to be effective against antibiotic resistant MRSA bacteria, *E. coli* bacteria and *Candida albicans* fungus. Additionally, in February 2023, the Cho Group and IVX entered into an agreement for the co-development of the Photosoft™ technology for atherosclerosis and infectious diseases in the United States, Canada and Hong Kong.
6. **IVX has encouraging pre-clinical results and strong partnerships in cancer –** In recent years, IVX has collaborated with PMCC and the Hudson on the pre-clinical development of Photosoft™ products. INV043 has produced favourable results in TNBC and anogenital cancers through these partnerships. Additionally, based on work at the Hudson, the combination of INV043 and immune checkpoint inhibitors (ICIs) enhanced the effectiveness of the cancer treatment by 65% in mice with TNBC when compared with standalone therapy. The combination of INV043 and ICIs has potential to open up possibilities for partnerships as pharmaceutical companies with ICI drugs could benefit from combining with INV043, which could result in improvement of clinical outcomes.
7. **IVX's management team has rich experience –** IVX's seasoned board and management teams have experience across various industries including health care, investment banking and consulting. Its Executive Chairman Thian Chew has more than 25 years of experience in investing, finance and transforming business operations. Rob Merriel, a member of the IVX board, is a Certified Practicing Accountant (CPA) with over 35 years of experience in medical research (Hudson Institute of Medical Research and Baker Institute), large public healthcare services (Melbourne Health and Southern Health) and commercial organisations (Pacific Dunlop and Deloitte Consulting).
8. **Photosoft™ provides a clear advantage over existing PDT treatments** – There are FDA approved PDT treatments on the market, but other PDT therapies have historically had significant off target issues and other severe side effects. For these reasons, such therapies have filed to gain much commercial success. This could change with Photosoft™ as results to date shows it overcomes many of these issues.
9. **We believe the business is undervalued at the current market price -** IVX's stock is currently trading significantly below our base case valuation. We believe it has potential to reach previous highs again as the clinical development of INV043 further de-risks its product. We think the stock can re-rate to our valuation range (A$0.016-0.021) based on the positive news flow around the success clinical trials, regulatory approvals, signing of major research partnership, distribution deals in remaining geographies and value-enhancing acquisitions.

What is Photodynamic Therapy?

Photodynamic therapy uses the combination of light and a photosensitising compound for effectively killing cancer cells and promoting anti-cancer immune response.

Photodynamic Therapy (PDT) is a medical therapy involves the use of a photosensitising compound, oxygen and light to generate destructive reactive oxygen species (ROS) for killing cancer cells selectively and promoting anti-cancer immune response (Figure 1). PDT therapy has been approved by the FDA for treating certain types of cancers and is an effective strategy for the ablation of tumour tissues. It is less invasive than surgery, has minimal side effects and offers an alternative treatment option that can help achieve tumour regression and long-lasting remissions. As we will address later in the report, PDT has potential to help with other medical indications, although the most research has been conducted against cancer.

Figure 1: Photodynamic Therapy (PDT)



Source: Company, Pitt Street Research

PDT's potential as a cancer treatment

When PDT is used as a cancer treatment, a drug called 'photosensitising agent', which is preferentially taken up by cancer cells[1], is administered to the patient. When the patient is selectively exposed to light beams at a wavelength corresponding to the absorption band of the photosensitiser, the drug produces activated oxygen molecules that damage nearby cells[2]. Although some companies and academic groups have worked on PDT for many years, the approach is yet to gain mainstream recognition as a cancer therapy. This is partially because photosensitising agents that have been tried were lacking in the following aspects:

- Poor water solubility to allow for good tissue distribution and targeting to tumour sites[3]
- Poor potency
- Off-target toxicity
- Extended retention periods in tissue meant patients were left vulnerable to damage from sunlight and other light sources following treatment

However, we think IVX's INV043 product based on the Photosoft™ technology is likely to represent a breakthrough product in the field.

[1] There are various reasons advanced as to why this is the case, although no-one really knows. One possibility is the 'enhanced permeability and retention effect' in which the leaky blood vessels which feed tumours promote the uptake of all sorts of nanomaterials. Or it could be that there's just a lot of newly synthesised collagen in the neighbourhood that naturally binds to porphyrins. Dougherty et. al. suggest a few ideas in J Natl Cancer Inst. 1998 Jun 17;90(12):889-905.
[2] Specifically, the activated sensitiser produces an activated oxygen species called 'singlet oxygen' that oxidises critical elements of the cancerous cells.
[3] Trends Biotechnol. 2008;26:612–621.

We would also point to an investigator-led clinical trial that RMW Cho Group is conducting on prostate cancer. Interim results found that the phase 2 trial safety criteria are being met regarding the sensitiser doses, plus the laser light energy delivery and equipment. Normal bladder and bowel function has been maintained and as well, unaltered erectile potency has been recorded. A stable or decreasing PSA has been recorded in 15/21 patients treated > 6/12. Prostate size reduction has also been recorded.

Quantitative scientific pre and post treatment proteomic results of cancer necrosis, inflammation, vascular and significant immune responses have confirmed those of the Phase 1 study.

Why is PDT not a routine therapy in cancer treatment, despite it being so effective?

It is often seen that various treatments are discovered in cancer therapy but largely ignored by the mainstream for decades before being taken up again. A classic case in point is one where the patient's own immune system is harnessed to attack the cancer. This approach was first worked upon in the 1890s, but it is only today[4] that its clinical potential is being realised. Generally, the catalyst for the rediscovery of the forgotten approach is one successful clinical study of a new compound/API after a long history of products that showed promise but had drawbacks of some kind. This is indeed PDT's history, where prevailing photosensitisers exhibited significant off-target issues.

Since Photofrin, better photosensitisers have been developed, but none have got to the point where it is a must-use cancer therapy. 5-Aminolaevulinic acid (5-ALA), a porphyrin precursor, worked faster than Photofrin but had poor bioavailability[5]. Metvix and Hexvix[6], esters of ALA, had better bioavailability but were weak on long-wavelength absorption and thus remained largely only for diagnostic use. Foscan (temoporfin) proved useful therapeutically and, as a result, was approved for the treatment of head and neck cancer[7] in Europe in 2001. As a chlorin derivative, Foscan had improved long-wavelength absorption. However, the product left patients photosensitive for around three weeks after initial illumination.

What is Next Generation Photodynamic Therapy (NGPDT)?

Next Generation Photodynamic therapy is a chlorin-based PDT photosensitiser developed by RMW Cho Group.

NGPDT, also known as Photosoft™ technology, is a chlorin-based PDT photosensitiser that was first developed by the Cho Group over a decade ago. NGPDT is a ground-breaking technology that addresses the challenges of earlier PDT technologies with the aim of transforming the treatment of a wide range of cancers. It is a minimally invasive modality for cancer treatment that specifically identifies and destroys cancer cells. At the same time, it also leaves the rest of the body's normal cells unharmed. Specifically, it is a chlorin based photodynamic therapy[8], which for diagnostic purposes can be activated at two different light wavelength ranges and for treatment is normally activated with red light in the 650-670 nm range. The original

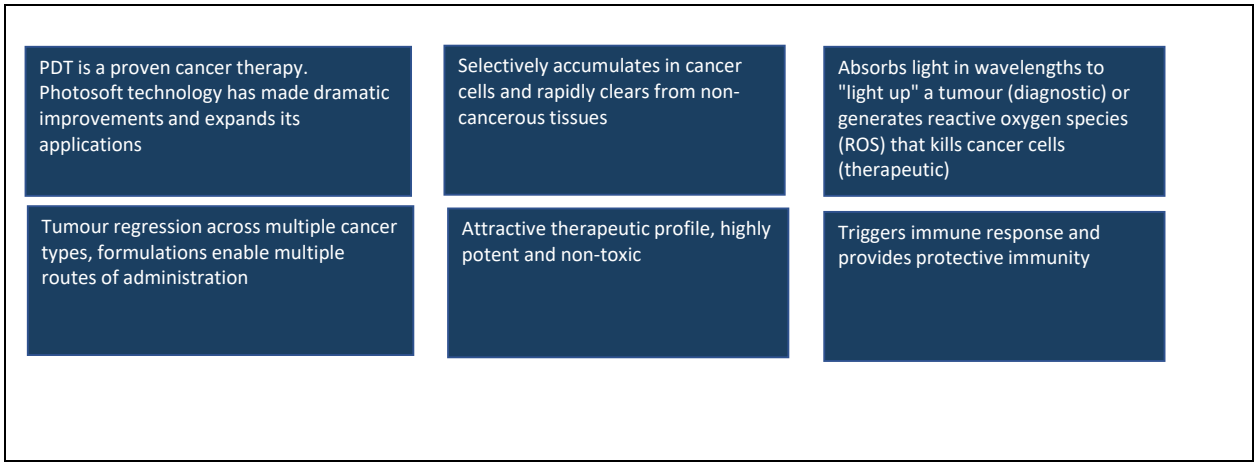
[4] Another example is brachytherapy, where radioactive beads are placed at the site of the tumour for localised radiotherapy. This was tried out by the British surgeon Sir Geoffrey Keynes (1887-1982) in the late 1920s. Brachytherapy, however, really became feasible in the 1990s when imaging modalities allowed better positioning of brachytherapy.
[5] J Pharmacol Exp Ther. 2002 May;301(2):507-12.
[6] Developed by the Norwegian biotech company Photocure (Oslo, OSE: PHO, www.photocure.com). See www.hexvix.com.
[7] It is still marketed by the German company biolitec – see www.biolitecpharma.com.

Photosoft™ is water soluble, can be administered via multiple routes of administration including topically and intravenously, allowing for patient convenience when appropriate.

IVX's Photosoft™ technology and INV043

IVX has been developing Photosoft™ technology as a novel NGPDT for the treatment of multiple cancer types since 2017. The Photosoft™ technology finds its utility in PDT with several key advantages as outlined in Figure 2. The technology was originally developed by The Cho Group. The company's current lead compound for cancer from the Photosoft™ technology is PDT photosensitiser INV043.

Figure 2: Advantages of Photosoft™ technology



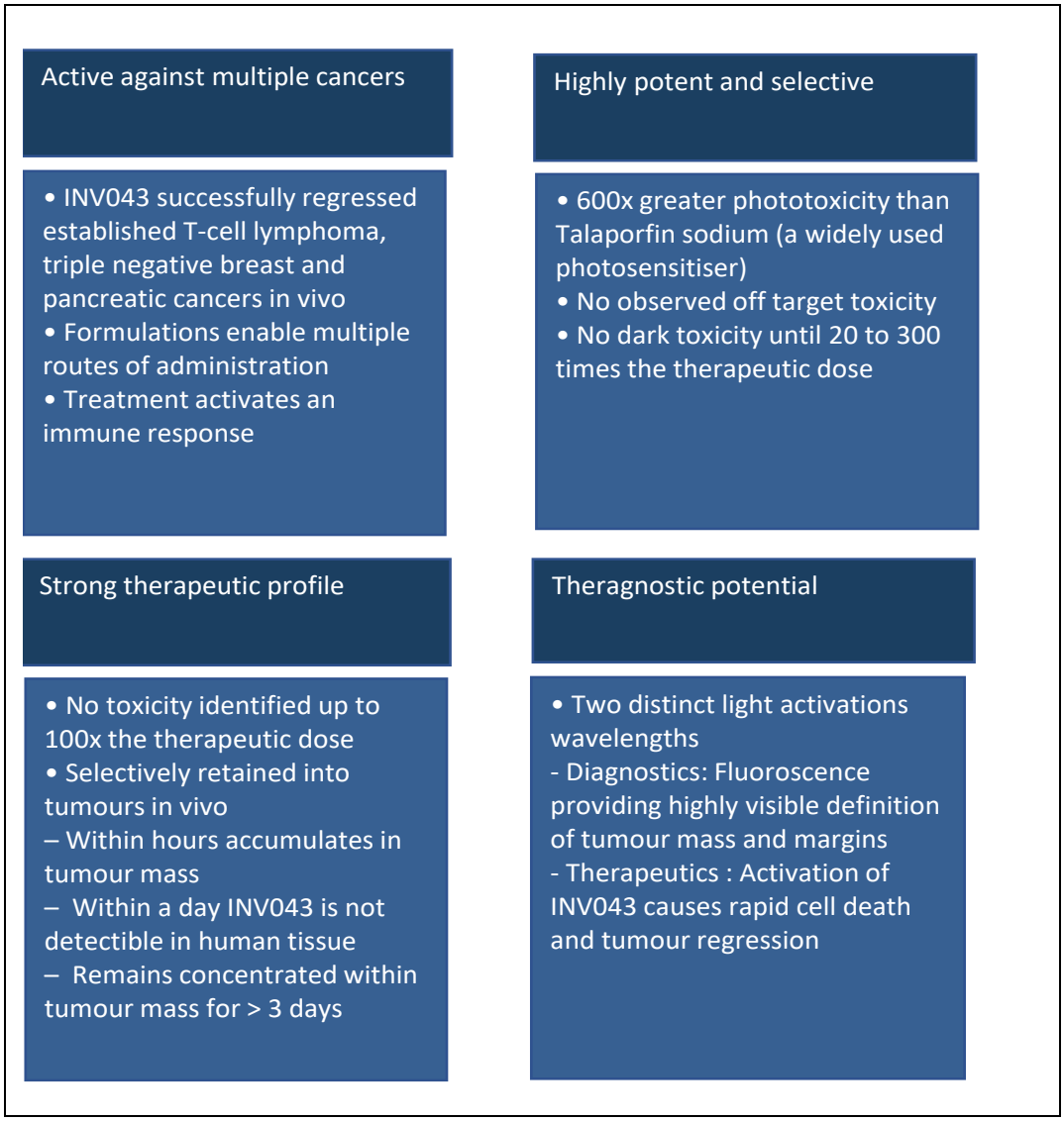
Source: Company

Why does INV043 represent a potentially superior PDT product?

IVX achieved substantial progress by working with Hudson Institute for the development of INV043 which is an improvement over the previous APIs. INV043 has greater anticancer activity and better cancer-targeting characteristics than previous generations of APIs developed by the company, including the original Photosoft™.

In FY2022-23, IVX achieved significant progress in proving up its API INV043, which is likely to be taken to clinical trials. INV043 exhibits various characteristics including being active against multiple cancers, being highly potent and selective, having a strong therapeutic profile and theragnostic potential (Figure 3 on page 10).

Figure 3: Key characteristics of the Improved API INV043 products



Source: Company, Pitt Street Research

IVX's leading drug candidate INV043 is effective in regressing multiple cancers in vivo, is non-toxic, safe and has limited side effects.

INV043 is IVX's leading drug candidate and represents the NGPDT that aims to treat multiple types of cancers. It is an enhancement of Photosoft™ that can be administered topically or intravenously, has greater cancer-killing potential, and has been shown to elicit an anti-cancer immune response in animal models.

Proof of Concept (PoC) studies of INV043 have shown that it is selectively absorbed by cancer cells, is effective in regressing multiple cancer types in vivo and stimulates the body's natural immune response. It also works additively with blockbuster ICI drugs, is non-toxic, safe, has limited side effects, and supports translations into successful clinical trials (Figure 4 on page 11).

Figure 4: Lead Cancer Drug Candidate INV043

Source: Company

INV043 was found to be a leading clinical candidate and more potent than IVX-P03 as per early work done by IVX.

The development of INV043

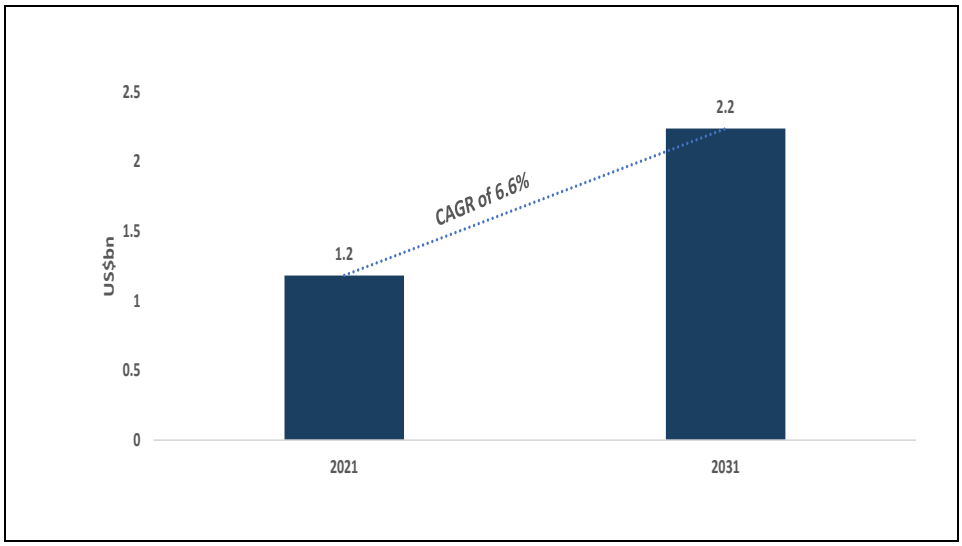
Since 2017, IVX has experimented with various Photosoft™ compounds. By 2020, it had worked on two of these compounds, which were codenamed IVX-P02 and IVX-P03. The latter of these compounds was unveiled in September 2019. COVID19 delayed plans for clinical trials using IVX-P03, but also gave IVX an opportunity to create a significant number of new compounds, from which arose multiple new patent filings.

By April 2021, the company had reached what it considered to be a clinical candidate with INV043. In May 2021, IVX reported early work showing that INV043 was much more potent than IVX-P03. Specifically, it had ~50 times greater phototoxicity than IVX-P03 and ~600 times greater than the widely used photosensitiser Talaporfin sodium.

IVX's commercialisation pathway

INV043 is on the pathway to participate in a major global market opportunity. The global PDT oncology market is forecast to grow at a CAGR of 6.6% from US$1.2bn in 2021 to US$2.2bn in 2031 (Figure 5).

Figure 5: The global PDT oncology market is likely to grow to US$2.2bn by 2031



Source: Company, Pitt Street Research, ResearchandMarkets

Photosoft™ technology is likely to be useful across a wide range of cancers (Figure 6).

Figure 6: Commercialisation pathway for IVX with PDT therapy across a range of cancers

INV043's application across cancers	
Skin Cancer	• Skin cancer is bifurcated into superficial basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and melanoma • PDT is often used to treat skin cancers such as actinic keratosis or some cases of nodular BCC • IVX expects that its first clinical studies will be in BCC, following through from earlier pre-clinical results
Ovarian Cancer	• Conventional treatment options are limited but the clinical data from other PDTs are encouraging • The global ovarian cancer drug market is expected to grow at a CAGR of 8.3% from US$2.3bn in 2021 to US$5.1bn in 2031
Anal Cancer (SCC)	• Anal cancers range from primary to metastatic and molecular subtypes, all of which respond to the killing action of INV043 • The global market for anal cancers is estimated to be worth US$1.3bn by 2028 at a CAGR of 6.3%.
T-cell lymphoma	• T-cell lymphoma is a type of cancer that gets formed in T cells which are a type of immune cell • Significant regression was observed *in vivo* in T-cell lymphoma when photoactivated INV043 was used to treat the cancers • T-cell lymphoma market is likely to grow from US$1.6bn in 2021 to US$2.7bn in 2027 at a CAGR of 9.2% during the forecast period

Triple Negative Breast Cancer (TNBC)	• TNBC is a hard-to-treat, aggressive and metastatic type of tumour resistant to most chemotherapies. • Regression was observed in vivo in TNBC when photoactivated INV043 was used to treat the cancers
Pancreatic cancer	• INV043 was strongly localised to tumour mass and margins in pancreatic tumours • Pancreatic tumours were regressed following treatment, determined by a decrease in measurable volume
Ano-genital cancer	• Ano-genital SCC is a rare but often invasive malignancy that is becoming an increasingly prevalent public health problem • The company plans to conduct clinical trials in ano-genital cancer with strong in vitro and in vivo results demonstrating both safety and efficacy profiles
Colorectal cancer	• Colorectal cancer is the second most diagnosed cancer in the world and widely pertains to lifestyle and age-related factors • INV043 has been evaluated in colorectal cancer cells. • The global colorectal cancer market is likely to grow from US$18.6bn in 2022 to US$24.1bn in 2028 at a CAGR of 4.4%.

What territories is IVX licensed for the commercial development of Photosoft™ technology?

IVX is the exclusive licensee of the Photosoft™ technology for cancer treatments in Australia, New Zealand and all countries in the Asia-Pacific excluding China (but including Hong Kong), Macau, Taiwan, Japan and South Korea.

Cancer

IVX is the exclusive licensee of the Photosoft™ technology for the treatment of cancers in Australia, New Zealand and all countries in the Asia Pacific excluding China (but including Hong Kong), Macau, Taiwan, Japan and South Korea.

IVX's appointment was made by the Cho Group that has funded and successfully commercialised several unique and advanced technologies. The development of the Photosoft™ technology is funded by the Cho Group through an R&D services agreement. IVX is leading the R&D programme for the development of the Photosoft™ technology across a range of cancers and the associated light device. The deal provides for Cho Group to contribute its existing intellectual property and know-how in relation to the Photosoft™ technology for the applicable cancer indications.

In FY22, IVX's initial exclusive licensing agreement with the Cho Group was expanded with the aim of granting the company access to markets with more than 2.8 billion people.

Atherosclerosis and Infectious Diseases

Evidence of PDT's usefulness exists across a range of disease conditions. IVX has the right to develop Photosoft™ in atherosclerosis and infectious diseases in the Asia Pacific region (excluding Greater China, Middle East and Russia). It recently signed a deal to expand the territories for infections diseases to include the United States, Canada and Hong Kong. It also has the option to include atherosclerosis in these three countries.

Atherosclerosis is a disease where there is a build-up of plaque inside arteries. Atherosclerosis is a major contributor to cardiovascular diseases, which are the largest cause of deaths worldwide. The global market for atherosclerosis treatments is likely to grow to US$56.6bn by 2027, with Asia Pacific being the fastest growing market.

In November 2021, IVX raised A$12m through a placement of new shares to existing and new professional and sophisticated investors. Out of the total proceeds from the placement, A$5m have been paid to the Cho Group for development costs of the Photosoft™ technology pertaining to indications under Conditional agreements and funding of pre-clinical work and clinical trials in the new territories. The remaining proceeds are likely to be used in the discovery of atherosclerosis and infectious diseases, general working capital and operational costs and to fund the costs of the capital raising.

IVX receiving IP protection at the right time

International patents provide important protection to companies that obtain them. There are several immune checkpoint inhibitor (ICI) immunotherapies that are coming off patent by the end of this decade. Most notably, Keytruda's and Opdivo's US patents both expire in 2028 (these are existing ICI treatments on the market). Finding potential new combination therapies with INV043 may open avenues to collaborations and extending patent protections on these ICIs.

In November 2021, the RMW Cho group filed international patent applications including related to the lead compound INV043. Three additional international patent applications were filed in November 2022. When approved, the new patents are likely to extend the global IP protection for Photosoft™ technology for another two decades, providing a level of protection that other ICI treatments do not have. In July 2023, an Australian patent for Photosoft™ was granted which included coverage of INV043.

In the longer-term, we think this 'patent cliff' could entice large pharmaceutical companies to look at Photosoft™ as a way to extend their patents.

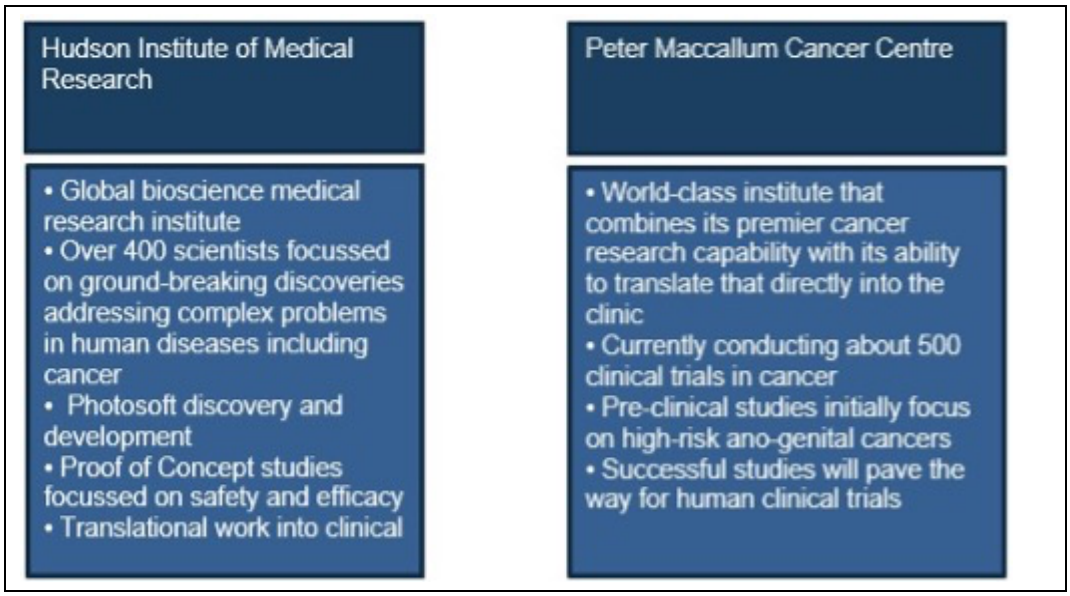
The Photosoft™ technology has the potential to revolutionise the treatment for cancers and infectious diseases.

We believe that the Photosoft™ technology has the potential to revolutionise the treatment for cancers and other diseases. Its unique properties provide the company multiple avenues for realisation of value for its shareholders.

IVX's pre-clinical experience

In recent years, IVX has collaborated with PMCC and Hudson Institute on the pre-clinical development of Photosoft™ products (Figure 7).

Figure 7: Key partnerships with world-leading institutions



Source: Company, Pitt Street Research

The initiatives conducted across various types of cancers are outlined below.

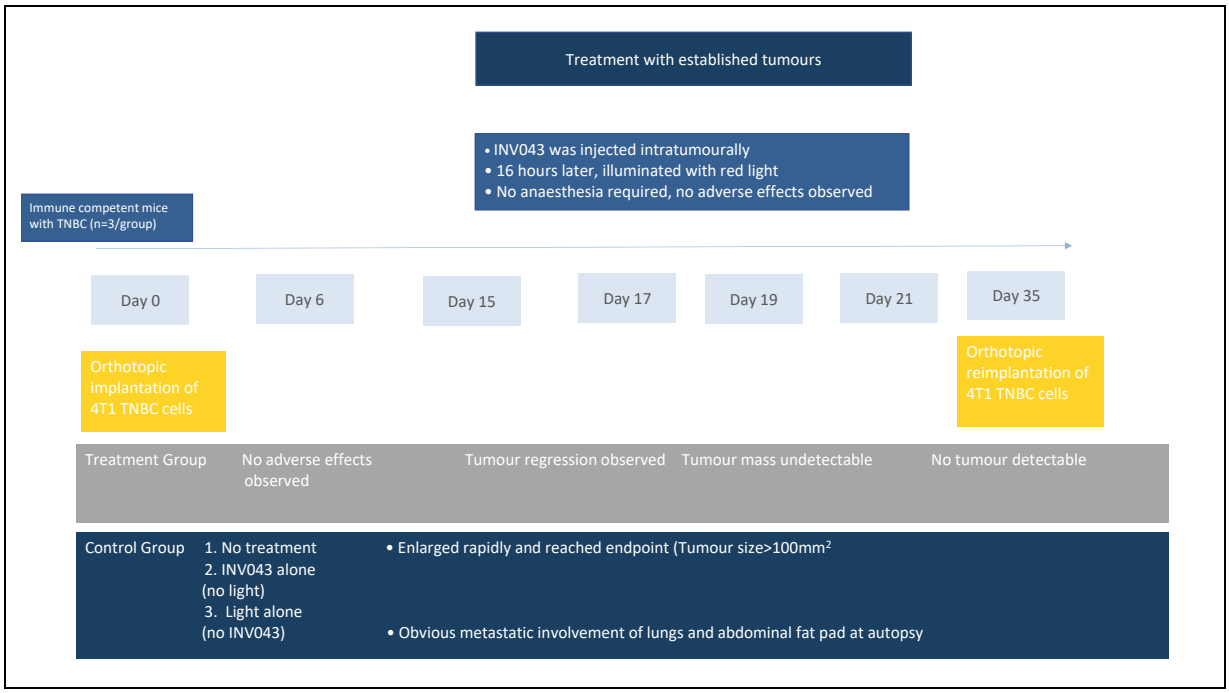
Triple Negative Breast Cancer (TNBC)

In October 2021, IVX reported favourable pre-clinical results in Triple-Negative Breast Cancer (TNBC) with INV043. In December 2021, Hudson Institute released findings from its follow up PoC II studies. The studies utilised IVX's API INV043 for the treatment of immunocompetent mice that had been implanted with TNBC.

The API for INV043 is active against multiple cancers, highly potent and selective, has a strong therapeutic profile and has a strong theragnostic potential.

The results of the PoC pilot work showed complete tumour regression with no recurrence of disease in the treatment of mice with photoactivated INV043. The testing approach used was the intra-tumoural injection of INV043 into the treatment group with established tumours (Figure 8 on page 16). The non-establishment of new tumours suggested development of protective immunity (following the treatment of INV043), which is a key requirement to maintain long term remission.

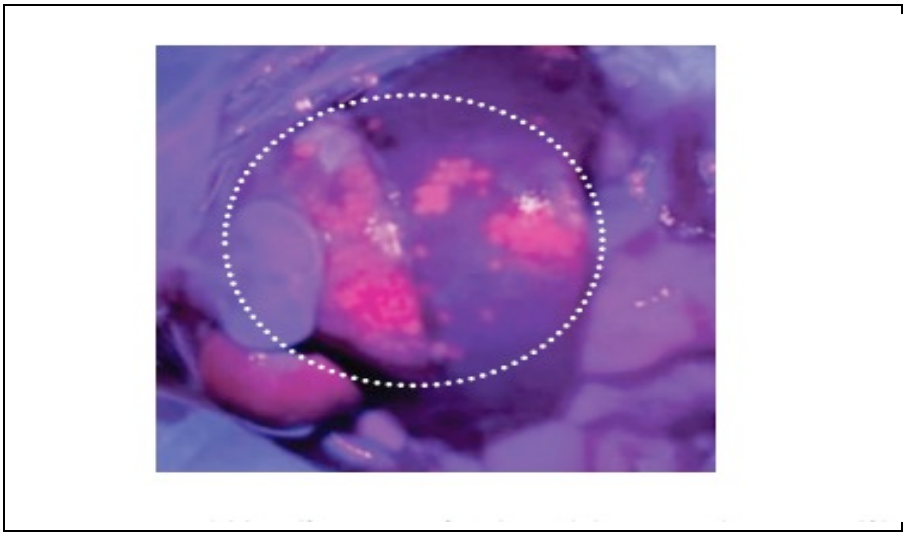
Figure 8: Testing approach for Primary Tumour Pilot study



Source: Company, Pitt Street Research

In a separate study, in vivo tumour localisation was also monitored using the intrinsic fluorescence of INV043 under blue light (Figure 9). This resulted in the localisation of INV043 to tumours, selective retention in tumour tissues and non-toxicity.

Figure 9: Fluorosence of tumour under light by INV043



Source: Company, Pitt Street Research

These results provided a direct proof-of-principle for the use of INV043 as a cancer therapy. It has also shown good promise as a potential treatment for TNBC as well as a range of other hard to treat cancers. We believe that INV043 is effective at regressing primary tumours and may prevent cancers from returning or spreading to other parts of the body by inducing an immune response. This sets it apart from other cancer treatments.

Combination of INV043 and immune checkpoint inhibitors

The Hudson Institute successfully completed its third PoC study examining the use of IVX's lead drug candidate INV043 in combination with immune checkpoint inhibitors (ICIs). In May 2022, a low dose of INV043 achieved considerable tumour regression when used in combination with ICIs. ICIs (such as Keytruda etc.) are widely used for the treatment of lung cancer and melanoma. However, one drawback of ICIs is that they have limited effectiveness against several types of cancer as monotherapy despite widespread clinical use. Additionally, they are effective only on a small proportion of patients.

The third PoC study discovered that combination therapy enhanced the effectiveness of the treatment by around 65% in mice with TNBC as compared to standalone ICI therapy. It also achieved stabilisation and regression of tumours despite restrictions in treatment protocols. Additionally, the tumours were significantly smaller than those in mice that received monotherapy.

We believe that the combination of INV043 and ICIs is likely to enhance anti-tumour efficacy compared to monotherapy alone, as the treatment will result in direct tumour cell death and improve anti-tumour immune responses. The combination of INV043 and ICIs is further likely to open up possibilities for partnerships. This can be attributable to INV043 providing scope to pharmaceutical companies with ICI drugs for enhancement of clinical outcomes and extension of the patent life for ICI therapies.

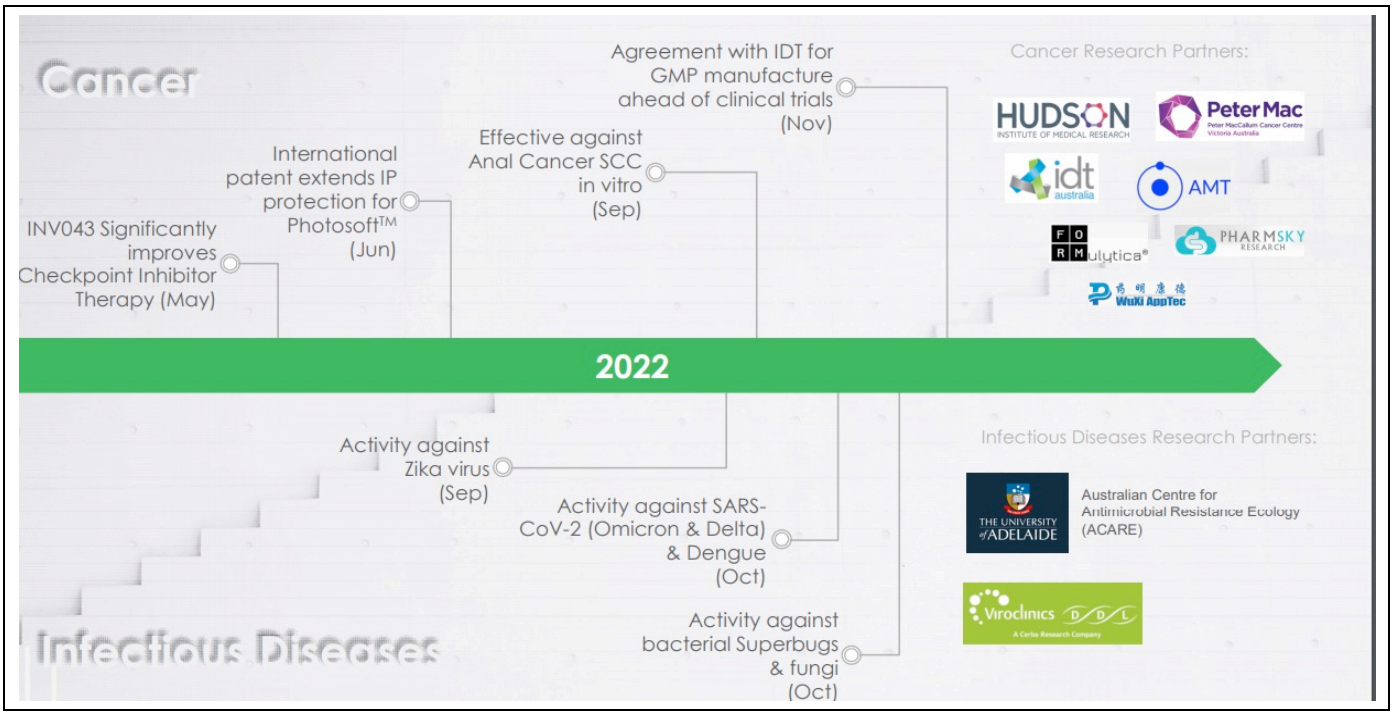
Squamous cell carcinomas (SCCs)

In September 2022, IVX was able to show that INV043 could work against SCCs associated with anal cancers *in vitro*. Successful *in vitro* studies conducted by PMCC demonstrated INV043's effectiveness against six SCC cell lines. The main objective of the studies was to assess the relative cytotoxicity of light activated INV043 of human anal SCC cell lines. The assessment was done by

- Comparing the phototoxicity of a sentinel cell line (called immortalised human embryonic kidney cells) used in both Hudson Institute and PMCC
- Testing the phototoxicity of human HPV+ve and -ve anal SCC cell lines
- Testing the phototoxicity of a unique mouse anal SCC model developed at PMCC

The results were consistent with the promising outcomes achieved by Hudson Institute on other cancer types.

Figure 9: IVX's key achievements in 2022



Source: Company, Pitt Street Research

Multiple Photosoft™ compounds were effective in inhibiting Delta and Omicron strains of the COVID-19 virus at much lower concentration levels than Remdesivir.

What are the latest in-vitro tests being conducted?

Successful in-vitro tests conducted on COVID-19

IVX announced successful *in vitro* tests on the virus causing COVID-19. The COVID-19 pandemic resulted in significant disruptions to the medical science industry including logistical delays and shortages of qualified staff and materials. Under the studies, ten different Photosoft™ compounds at eight concentrations were tested for antiviral activity against the SARS-CoV-2 strains. The control group was treated using Remdesivir which is a broad-spectrum antiviral medication developed by global pharmaceuticals company Gilead Sciences. Results from separate studies conducted in October 2022 indicated that nine out of ten Photosoft™ compounds tested by Viroclinics and VRS displayed antiviral activity against the Delta and Omicron BA.1 Variants of SARS-COV-2. The results showed that multiple Photosoft™ compounds exposed to specific light wavelengths were effective in curbing the Delta and Omicron strains of the virus. Additionally, Photosoft™ compounds were effective at much lower concentration levels in comparison to Remdesivir.

In-vitro tests effective against the treatment of infectious diseases

Since June 2021, IVX has undertaken preparatory and early-stage preclinical work using Photosoft™ to treat atherosclerosis and infectious diseases, including viruses, bacteria and fungi.

- **Viruses**
    - **Zika –** Many Photosoft™ compounds had >100x the activity of Monensin (selected control) in vitro. Zika virus, which is found in

86 countries, is linked to birth defects and other neurological complications.

  - **Dengue** – Dengue causes intense pain in the joints and muscles and hence has received the name breakbone fever. In vitro studies of the Photosoft™ technology resulted in positive screening results to inhibit the Dengue virus. The tests were done on ten Photosoft™ photodynamic compounds at eight concentrations. As per the tests, eight out of ten compounds displayed antiviral activity against the Dengue virus after exposure to a specific light wavelength (660nm). The halved maximal effective concentration (EC50) values of eight Photosoft™ compounds were significantly lower than that of Monensin, an antibiotic with known activity against the Dengue virus.
  - **SARS-CoV-2** – The Photosoft™ technology has shown encouraging results against the Delta and Omicron BA.1 variants of SARS-CoV-2 (the virus behind COVID-19) during in vitro tests conducted in CY21. The Photosoft™ compounds were more potent than Remdesivir – in fact, some compounds had EC50 values that were 250-400 times smaller than Remdesivir, meaning the amount required was substantially lower than Remdesivir to achieve the same outcome.

- **Bacteria and fungi** – *In vitro* tests using Photosoft™ are effective against multiple strains of antibiotic-resistant MRSA (Methicillin-Resistant *Staphylococcus aureus*) bacteria, *Escherichia coli* bacteria and *Candida albicans* fungus in tests undertaken at the Australian Centre for Antimicrobial Resistance Ecology (ACARE) in the University of Adelaide. MRSA is a so-called superbug, in other words an antibiotic resistant bacterium. Being antibiotic resistant, they are difficult to treat. The World Health Organisation (WHO) has declared antimicrobial resistant viruses as one of the top ten threats facing humanity[9].

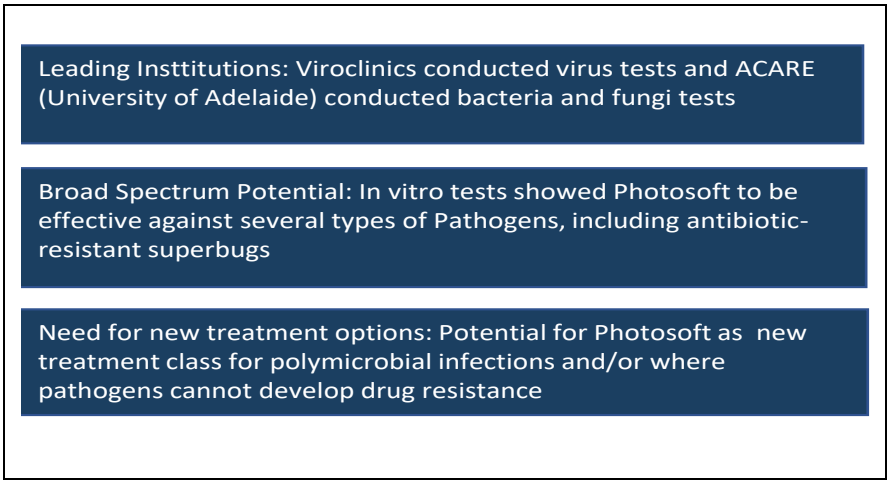
  The studies tested the activities of Photosoft™ compounds across a range of pathogens and resulted in the following discoveries.

  - Five of the seven Photosoft™ compounds tested against two strains of MRSA bacteria displayed antimicrobial activity.
  - The same five compounds were also active against two *Candida albicans* strains (a yeast that causes fungal infections) when exposed to a specific wavelength (660nm) of light.
  - The Photosoft™ compounds tested showed potential for use against *Escherichia coli* (*E. Coli*) bacteria. Although *E. Coli* can be found in intestines of healthy people and are mostly harmless, some pathogenic strains can cause problems such as diarrhoea, blood poisoning or diseases outside the gut such as urinary tract infections.

[9] https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance

Photosoft™ technology was proved to be effective against several types of pathogens including antibiotic resistant superbugs.

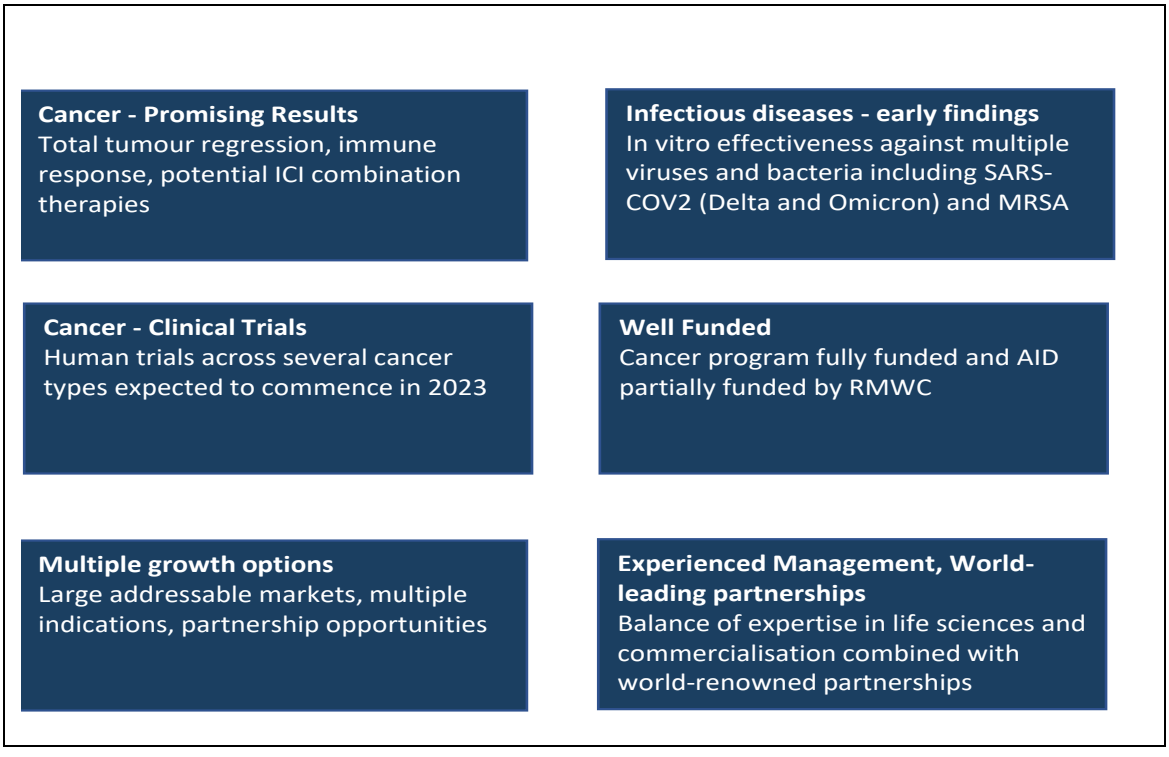
Figure 10: The Photosoft™ technology has broad-spectrum anti-microbial potential



Source: Company, Pitt Street Research

We believe that the Photosoft™ technology has the potential to kill a variety of superbugs that would also not develop resistance to this treatment, and also a likely added advantage of application to polymicrobial infections. (Figure 11).

Figure 11: In- vitro studies have shown effectiveness against multiple viruses and bacteria



Source: Company, Pitt Street Research

Comparable companies

The global PDT market is fairly concentrated but there is a lack of pure-play players and publicly-listed entities. Further, there are companies that are focussing only on medical devices relating to PDT. Hence, for comparable companies (Figure 12) of IVX, we have used the following criteria:

1) Public as well as private entities with PDT as one of their focus areas.
2) Companies operating in developed markets.
3) Entities should not be focussing on just medical devices relating to PDT.

Figure 12: Comparable companies

Public Company	Location	Ticker	Market cap (US$m)	Website
Dong Sung Bio Pharm. Co. Ltd.	South Korea	KOSE:A002210	119.4	www.dongsung-pharm.com
Theralase Technologies Inc.	Canada	TSXV:TLT	61.6	www.theralase.com
Biofrontera Inc.	US	NasdaqCM:BFRI	24.5	www.biofrontera-us.com
PhotoCure ASA	Norway	OSE:PHO	145.8	www.photocure.com
Soligenix Inc.	US	NasdaqCM:SNGX	16.8	www.soligenix.com
Invion Ltd.	Australia	ASX:IVX	30.9	www.inviongroup.com

Private Company	Location	Website
DUSA Pharmaceuticals	US	www.dusapharma.com
Fluence Therapeutics Inc.	US	
Galderma SA	Switzerland	www.galderma.com
Light Farm Tech Co. Ltd.	South Korea	www.litepharm.com
Luzitin SA	Portugal	www.luzitin.pt

Source: S&P Capital IQ, Pitt Street Research

Dong Sung Pharm. Co. Ltd. (KOSE:A002210) is involved in pharmaceuticals, cosmetics, hair dye and PDT businesses in South Korea, China, Malaysia, Singapore and Thailand. The company is making strides within its cancer research centre, Daegu Cancer Center, which harnesses the potential of PDT or the use of light in cancer treatment. It is working with university hospitals and government agencies in developing new treatment solutions starting with pancreatic cancer.

Theralase Technologies Inc. (TSXV:TLT) is a clinical stage pharmaceutical company, dedicated to the research and development of light activated photo dynamic compounds and their associated drug formulations, to treat cancer, bacteria and viruses. It also manufactures and markets patented and proprietary super-pulsed laser technology for the healing of chronic knee pain, as well as for off-label use to heal various nerve, muscle and joint conditions. It was founded in 1994 and is based in Toronto, Canada.

Biofrontera Inc. (NasdaqCM:BFRI) is a biopharmaceutical company commercialising a portfolio of pharmaceutical products based on PDT and topical antibiotics. The company offers Ameluz (Aminolevulinic Acid Hydrochloride), its flagship drug, which is a topical gel. Ameluz is a porphyrin precursor, used in combination with PDT using BF-RhodoLED lamp, indicated for the lesion-directed and field-directed treatment of actinic keratosis of mild-to-moderate severity on the face and scalp.

Soligenix Inc. (NasdaqCM:SNGX) is a late-stage biopharmaceutical company, focussed on developing and commercialising products to treat rare diseases in the US. It operates in two segments, Specialized BioTherapeutics and Public Health Solutions. The Specialized BioTherapeutics segment develops SGX301 (HyBryte), a novel PDT, which has completed Phase III clinical trial for the treatment of cutaneous T-cell lymphoma; and SGX942, an innate defence

regulator technology that is in Phase III clinical trial for the treatment of inflammatory diseases.

DUSA Pharmaceuticals, operating as a subsidiary of Sun Pharma since 2012, develops and markets Levulan PDT and other products for common skin conditions primarily in the US, Canada and Korea. The company's key products include Levulan Kerastick 20% Topical Solution with PDT, as well as the BLU-U brand light source for the treatment of non-hyperkeratotic actinic keratosis of the face or scalp.

Fluence Therapeutics Inc., a spinoff of University Hospitals Case Medical Center, develops therapies for the treatment of psoriasis. The researchers at University Hospitals Case Medical Center and Case Western Reserve University have conducted Phase I clinical trials on a photosensitiser known as Pc4. Pc4 is a silicon phthalocyanine, which when excited by visible light, attacks tumour cells, abnormal vasculature and other lipophilic sites. It offers PDT that provides relief from moderate-to-severe psoriasis without harmful side effects or exorbitant costs.

Galderma SA manufactures medical and consumer skin health products. The company focusses on science-based solutions in the areas of acne, rosacea, psoriasis, atopic dermatitis, skin aging, sun protection and skin cancer. It provides PDT through Metvix, a topical photosensitiser containing 16% methyl aminolevulinate. It is indicated for the treatment of actinic keratosis, superficial and/or nodular basal cell carcinoma as well as Bowen's disease. Once a subsidiary of Nestle, it was sold to a consortium of private investors in 2019 and there are plans to take it public in 2HY23.

Light Farm Tech Co. Ltd. not only researches and develops next-generation photosensitisers for photodynamic diagnosis and treatment but also supplies photosensitisers such as Photofrin to university hospitals to treat early cancer. Photofrin is a next-generation cancer treatment that can preserve the functions of important human organs. It is used in university hospitals nationwide for the treatment of lung cancer, oesophageal cancer and biliary tract cancer, as well as for alleviating symptoms of terminal cancer.

Luzitin SA is a pharmaceutical company focussed on the pursuit of innovative solutions for PDT and photodiagnosis. The company's products include Luzitins that are third-generation photosensitisers belonging to the bacteriochlorin family. Its most advanced project (LUZ11) is currently in Phase IIa clinical trials for the treatment of solid tumours.

Photocure is a photodynamic technology company focusing on bladder cancer. It is a specialist in blue-light cystoscopy (BLC) which identifies tumours utilising both ultraviolet (UV) and white light as well as imaging dye. Photocure's flagship technology is Cysview (also known as Hexvix) that is FDA-approved and commercialised.

Valuing IVX: DCF highlights significant upside potential

We value IVX at A$0.016 per share in our base case and A$0.021 per share in an optimistic (or bull) case scenario using a DCF approach (Figures 14-15 on page 25). We believe this is a conservative estimate as our growth assumptions for the addressable market is highly subdued. Given IVX is a young business operating in a growing industry vertical, we have deployed a three-stage FCFF (Free Cash Flow to the Firm) as our valuation framework.

Here are our key assumptions:

- **Commercialisation timeline**: We assume IVX commercialises INV043 starting in FY26 in the Asia-Pacific and in Hong Kong, followed by North America, Australia and New Zealand in FY27.
- **Revenue**: We assume IVX continues to receive an R&D service fee, modelling 10% growth annually until FY26 with growth slowing thereafter. For INV043, we assume it enters commercialisation against cancer and antibiotic resistant MRSA bacteria. Sales revenue is calculated by modelling the number of patients in each jurisdiction, assuming PDT captures a prevailing market share that increases over the life of our model. We assumed a US$10,000 per patient cost and a modest 1% growth in costs per annum. The revenue (Figure 15 on page 25) is subject to the clinical trial success rate factor.
- **Market share**: We assume the company's market share gradually increases over time. We first assume the market share of PDT (ranging between 20 and 30% by the end of the life of our model) and then assume INV043 can capture a modest share of that 20-30%. We then assume that Invion can capture a very modest shares of that PDT opportunity, ranging from 2-3% from market to market. We have assumed a 1.50 AUD/USD exchange rate. We have taken a similar approach with the MRSA market but have assumed a higher market share for PDT generally (peaking at 25% in the USA, 40% in Canada and 50% in Hong Kong) and a higher share of that proportion for Invion (peaking 9% in the USA, 16% in Canada and 30% in Hong Kong).
- **Expenses**: We model employee benefits, R&D and administrative expenses as a share of revenue, while depreciation and amortisation is a percentage of IVX's PPE and Intangibles books - 30% and 3% respectively. Although this is a big difference, the small size of the PPE book ensure that depreciation is no more than a nominal amount (see our Financial Statement estimates on page 2).
- **Profitability**: We assume that the company slowly grows its margins from the time it first achieves profitability (which we have modelled as in FY27). In FY27, we model a 5.8% EBITDA margin and a 3.4% NPAT margin but these figures grow to 16% and 11% by FY30, respectively. We note that as a vertically integrated firm, IVX will have more control over its supply chain (post attaining scale) which could lead to efficiency gains. We have assumed that the company's R&D services fee revenues are enough to keep it from requiring a further capital injection.
- **Discount rate and terminal value growth rate:** We have used a WACC of 15.6%. This is derived from a risk-free rate of 3.6% (the rate of the 10 year government bond), a 1.50 beta and a 8.0% equity premium. We have not assumed the company acquires debt and the weight of equity is 100% accordingly.

– **Base and bull case differences**: The two major differences between our base and bull cases are the success rate of the clinical trials and IVX's penetration rate across geographies. We have assumed a 25% success rate of clinical trials in our base case and 35% rate in our bull case. In addition, we have assumed slightly higher market penetration that averages 20-30% higher across the jurisdictions.

Figure 14: DCF valuation for Invion

Valuation (A$m)	Base case	Bull case
Enterprise Value	**97.4**	**155.5**
Net debt (cash)	(5.1)	(5.1)
Equity value	**102.4**	**160.5**
Shares outstanding	6,420.1	6,420.1
Implied price (A$ cents)	**0.016**	**0.021**
Adjusted Current price (A$ cents)	0.006	0.006
Upside (%)	*170.4%*	*257.1%*

Source: Pitt Street Research

Key share price catalysts

IVX's stock is currently trading below our base case valuation. We think the stock can re-rate to our valuation range based on positive news flow around successful clinical trials, regulatory approvals, signing of major research partnerships, distribution deals in remaining geographies and value-enhancing acquisitions.

Figure 15: DCF value in A$ cents using various WACCs (base case)

Sensitivity						
WACC	**15.6%**					
Terminal Growth	**2.00%**					
Implied Price		*11.6%*	*13.6%*	*15.6%*	*17.6%*	*19.6%*
Change in Terminal Growth Rate	*1.0%*	2.6	2.0	1.5	1.2	1.0
	1.5%	2.7	2.0	1.6	1.2	1.0
	2.0%	2.8	2.1	**1.6**	1.3	1.0
	2.5%	2.9	2.1	1.6	1.3	1.0
	3.0%	3.0	2.2	1.7	1.3	1.1

Source: Pitt Street Research

Key risks facing IVX

We see five major risks for IVX as a company and as a listed stock:

- **Clinical risk**: There is the risk that the clinical studies of INV043 sponsored by IVX will miss their primary or secondary endpoints. The success rate for clinical trials varies significantly across technologies and is lower at earlier stages.
- **Market acceptance/ Competition risk**: There is the risk that even if INV043 passes clinical trials, it will fail to attract a strong following from oncologists. While IVX has a unique proposition to treat cancers, there are many small/medium-sized players developing different PDTs. This is apart from the existing larger players operating in the domain. It will be imperative for the company to gain advantage w.r.t. usability in order to establish its presence in the market.
- **Timing risk**: There is the risk that IVX's clinical programme may take longer to execute than the timing we have suggested in this note. This would have a negative effect on investor sentiment towards IVX.
- **Licensing risk:** There is the risk that RMW Cho Group may choose to license its NGPDT technology to groups in other parts of the world or not to license it in certain markets (particularly those we have modelled in this report). This would impact IVX's potential global market share.
- **Forex risk**: When commercialised, IVX's earnings will be in the local currency of applicable markets. Currency fluctuations can impact the company's total earnings in AUD. We have used a 1.5 AUD/USD exchange rate but fluctuations can impact our valuation. If we assume parity between the AUD/USD, our valuation drops to A$0.008 base case and A$0.012 bull case ceteris paribus. At the other extreme, if we assume US$1=A$2, our base case valuation will be A$01520 and our bull case will be A$0.023.

Risks related to pre-revenue Life Science companies in general.

The stocks of biotechnology and medical device companies without revenue streams from product sales or ongoing service revenue should always be regarded as speculative in character.

Since most biotechnology and medical device companies listed on the Australian Securities Exchange fit this description, the term 'speculative' can reasonably be applied to the entire sector.

The fact that the intellectual property base of most biotechnology and medical device lies in science not generally regarded as accessible to the layman adds further to the riskiness with which the sector ought to be regarded.

Caveat emptor. Investors are advised to be cognisant of the abovementioned specific and general risks before buying any the stock of any biotechnology or medical device stock mentioned on this report, including IVX.

IVX has seasoned leadership

Thian Chew has been the Executive Chairman and CEO of IVX since July 2021.

Thian Chew, Executive Chairman and CEO – Thian has over 25 years of experience in investing, finance and transforming business operations. He is a Managing Partner in Polar Ventures and brings financial and technology evaluation skills. Previously, he was an Executive Director at Goldman Sachs (Hong Kong and New York) and has held a number of positions in KPMG across Asia Pacific. Thian holds an MBA from Wharton School and MA from Lauder Institute, University of Pennsylvania.

Alan Yamashita, Non- Executive Director – Alan is a highly experienced corporate consultant and investment professional with more than 40 years of experience in investment management, investment banking and alternative investment throughout the APAC region. Additionally, he is another Managing Partner at Polar Ventures. He gained investment background at firms such as Goldman Sachs, Merrill Lynch and Mizuho Financial, and is now involved in venture capital.

Rob Merriel, Non-Executive Director – Rob is a Certified Practicing Accountant (CPA) with over 35 years of experience in medical research (Hudson Institute of Medical Research and Baker Institute), large public healthcare services (Melbourne Health and Southern Health) and commercial organisations (Pacific Dunlop and Deloitte Consulting). He has been a Director of two Venture Capital Funds and a Director and Company Secretary of several biotechnology focussed medical research institute spin-off companies.

Allistair Bennallack, Non-Executive Director – Allistair is currently the Group Chief Financial Officer of Village Roadshow Pty Ltd, Head of Risk for Village Roadshow Pty Ltd and Chief Executive Officer of Village Roadshow Theme Parks Asia, a division of Village Roadshow Theme Parks Pty Ltd. His previous roles include CFO of Village Roadshow Ltd and General Manager Business Affairs of Village Roadshow Corporation Pty Ltd (controlling shareholder of Village Roadshow Ltd).

Melanie Leydin, Chief Financial Officer – Melanie has an experience of over 25 years in the accounting profession. She has extensive experience in relation to public company responsibilities including ASX and ASIC compliance, statutory financial reporting, reorganisation of companies and is a director and company secretary for some entities listed on the ASX. Melanie graduated from Swinburne University in 1997, became a Chartered accountant in 1999 and has been the principal of chartered accounting firm Leydin Freyer since February 2000.

Claire Newstead-Sinclair, Company Secretary – Claire is an experienced finance professional with over 15 years of experience in senior financial roles within public and private entities across biotechnology, insurance and public practice sectors. Claire's most recent roles prior to joining Leydin Freyer include Director of Finance, Legal and HR and Company Secretary for Cogstate Limited. Claire is a member of the Institute of Chartered Accountants of Australia and New Zealand and is a certified member of the Governance Institute of Australia.

Appendix I - Glossary

Active Pharmaceutical Ingredients – component of an over-the-counter (OTC) or prescription medication that produces its intended health effects

Anti-microbial - A substance that kills microorganisms such as bacteria or mold, or stops from growing and causing disease

Apoptosis – refers to a type of cell death in body tissues. Apoptosis is a controlled (programmed) process that occurs to dispose of unwanted or damaged cells without causing an immune response.

Atherosclerosis - It is a disease where there is a build-up of plaque inside arteries and is a major contributor to cardiovascular diseases which is the largest cause of deaths worldwide.

Basal Cell Carcinoma (BCC) – A cancer of the basal cells in the lowest part of the epidermis.

Bioavailability – The quantity of a drug that can make it to its target once inside the body. High bioavailability is an important component in a drug's prospects for commercial success. High oral bioavailability is even more desirable because then the drug can be administered in pill form. Some drugs have high bioavailability when injected intravenously but low bioavailability orally.

Chlorophyll – The green pigment in plants necessary for photosynthesis, that is, the conversion of sunlight into fuel.

Endoplasmic Reticulum (ER) – is a large, dynamic structure that serves many roles in the cell including calcium storage, protein synthesis and metabolism of lipids. The diverse functions of ER are performed by distinct domains consisting of tubules, sheets and the nuclear envelope.

Fluorescence – is the process where a material absorbs light at a high energy, short wavelength and emits light at a lower energy and a usually visible wavelength.

Immune checkpoint inhibitors – A type of a drug that blocks proteins called checkpoints made by some types of immune cells such as T cells and some cancer cells. The checkpoints help to keep the immune responses from being too strong and sometimes can keep the T cells from killing the cancer cells. Blockage of the checkpoints can result in better killing of cancer cells.

Metastasis – The spread of cancer cells from the place where they were first formed to another part of the body. Cancer cells break away from the original (primary) tumour, travel through the blood or lymph system and form a new tumour in other organs or tissues of the body.

Necrosis – refers to a type of cell death in body tissues. Necrosis occurs when too little blood flows to the tissue due to cell injury. It results in the premature and uncontrolled death of cells and causes an immune response.

NIR – Near Infrared, the region of the electromagnetic spectrum from 750 nm to 2500 nm.

Photosensitiser – A molecule that undergoes a chemical reaction when exposed to light at a certain wavelength.

Reactive oxygen species (ROS) – Are chemical species that contain oxygen and which easily reacts with other molecules in a cell. A build up of ROS in cells may cause damage to DNA, RNA and proteins and may cause cell death. ROS includes singlet oxygen and free radicals also called oxygen radicals.

Squamous Cell Carcinoma (SCC) – A cancer of the squamous cells in the epidermis.

T Cells - are a type of white blood cells that help to regulate the body's immune response to specific pathogens.

Zika Virus – is transmitted primarily by Aedes mosquitoes, which bite mostly during the day.

Appendix II – Intellectual property

Photosoft and its derivative technologies are protected through thirteen families of patents. The original patents extend to 2033 and RMW (the technology licensor) has recently filed 12 new International Patent Applications, which includes the lead compound INV043.

These patents build upon previously granted Photosoft related patents, and upon approval, will extend the global intellectual property (IP) protection for the Photosoft technology for another 20 years from their priority date.

Appendix III – Capital Structure

Class	In millions	% of fully diluted
Quoted Securities		
Ordinary shares on issue	6,421.63	95.40%
Unquoted		
Options and performance rights	309.39	4.60%
Fully diluted shares	**6,731.03**	

Appendix IV – Top 10 Shareholders

Shareholder	%
Polar Ventures Limited	8.49
BNP Paribas Nominees <IB AU Retail Client DRP>	8.34
RMW Cho Health Technology	5.01
RMWC Pty Ltd <RMWC Family A/C>	4.90
Mr Honsue Cho	4.43
NGPDT Greater China	4.25
Mei Jun Lin	4.24
ACSLNC Pty Ltd <ACSLNC Family A/C>	3.60
Citicorp Nominees Pty Ltd	2.52
Shengli Wang	2.12

Appendix IV – Analyst certification

Stuart Roberts, lead analyst on this report, has been an equities analyst since 2002.

- Stuart obtained a Master of Applied Finance and Investment from the Securities Institute of Australia in 2002. Previously, from the Securities Institute of Australia, he obtained a Certificate of Financial Markets (1994) and a Graduate Diploma in Finance and Investment (1999).
- Stuart joined Southern Cross Equities as an equities analyst in April 2001. From February 2002 to July 2013, his research speciality at Southern Cross Equities and its acquirer, Bell Potter Securities, was Healthcare and Biotechnology. During this time, he covered a variety of established healthcare companies, such as CSL, Cochlear and Resmed, and numerous other emerging companies. Stuart was a Healthcare and Biotechnology analyst at Baillieu Holst from October 2013 to January 2015.
- After 15 months over 2015–2016 doing Investor Relations for two ASX-listed cancer drug developers, Stuart founded NDF Research in May 2016 to provide issuer-sponsored equity research on ASX-listed Life Sciences companies.
- In July 2016, with Marc Kennis, Stuart co-founded Pitt Street Research Pty Ltd, which provides issuer-sponsored research on ASX-listed companies across the entire market, including Life Sciences companies.
- Since 2018, Stuart has led Pitt Street Research's Resources Sector franchise, spearheading research on both mining and energy companies.

Nick Sundich is an equities research analyst at Pitt Street Research.

- Nick obtained a Bachelor of Commerce/Bachelor of Arts from the University of Sydney in 2018. He has also completed the CFA Investment Foundations program.
- He joined Pitt Street Research in January 2022. Previously he worked for over three years as a financial journalist at Stockhead.
- While at university, he worked for a handful of corporate advisory firms.

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