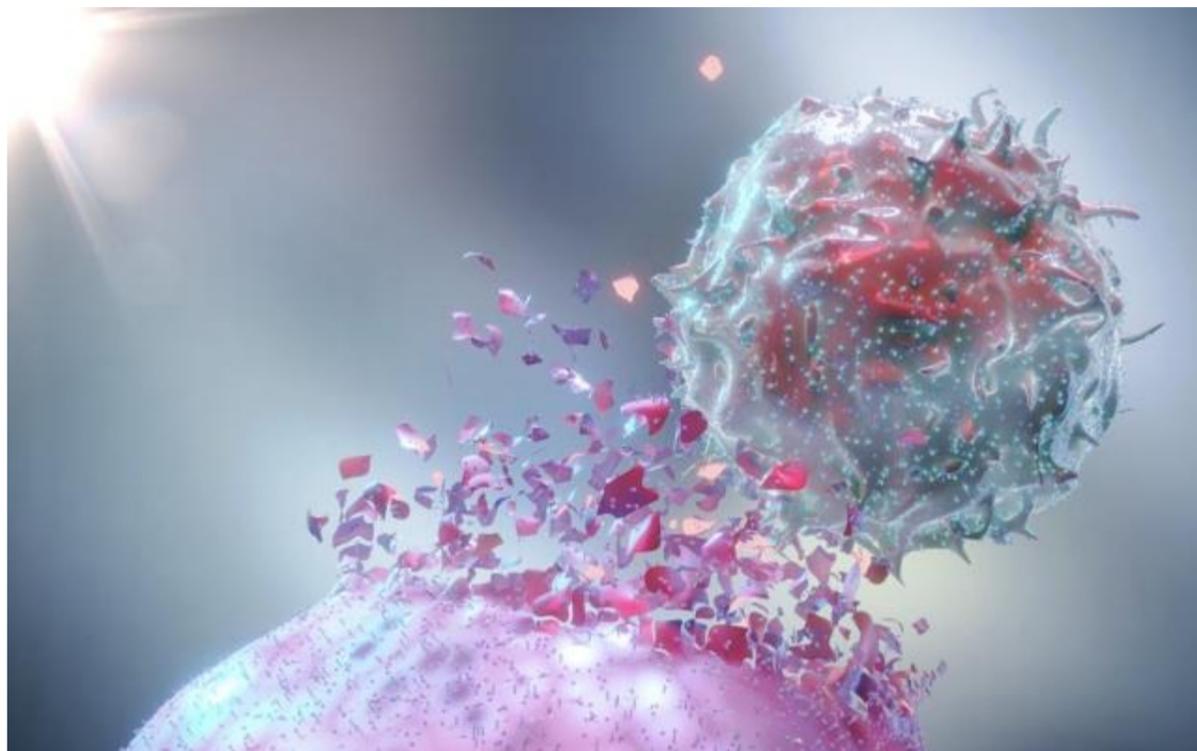


## Invion advances 'exciting' photodynamic therapy to treat a range of cancers

By **Lorna Nicholas** - September 9, 2021



**Invion Group's INV043 was shown to be effective at treating various cancers during in vivo proof-of-concept studies.**

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Life sciences company **Invion Group (ASX: IVX)** is rapidly advancing its next-generation photodynamic therapy INV043 for treating numerous cancers.

The drug is under development in collaboration with the world-leading Hudson Institute of Medical Research in Victoria.

Dr Andrew Stephens from Hudson Institute said Invion's INV043 was "exciting" and a "brand new way to treat cancers" using photodynamic technology.

He said Invion's INV043 had potential to treat a "wide array" of different cancers.

"It's the first drug, really, of its kind that can do that."

Dr Stephens has been working with Invion on advancing INV043, which is an active pharmaceutical ingredient (API), and based on photosensitive technology for treating cancers and other non-malignant diseases.

### Photodynamic therapy

 Photodynamic therapy is an emerging technology used in the treatment of cancer and some other non-malignant conditions.

 Initially, it works by using a drug that is activated by light to kill cancer cells.

 It is used in the form of lasers or LEDs.

It is a localised therapy, and mostly used to treat specific parts of the body.

The US Food and Drug Association approved earlier generations of photodynamic therapy for some cancers although they have had limitations which INV043 looks to overcome.

The pharmaceutical ingredient is the photosensitiser that is activated by light.

## Active and inactive compounds

In Invion's case, it has developed INV043 which is its latest active API using the Photosoft technology.

Dr Stephens explained an API is what does the work in pharmaceutical compounds.

"All drugs comprise active and inactive components. An inactive component would be the syrup in cough medicine for an example. An active component is the actual drug, so for example paracetamol that's in Panadol tablets."

"INV043 has been specifically selected to have very high activity and has been designed to be taken up into cancer cells specifically."

"In vitro testing showed us that INV043 has exceptionally high activity – it's around five-to-six hundred-fold more active than similar compounds that are used clinically."

He said it was also about 50 times more active than Invion's previous API IVX-P03

## Photo activatable

As with other photosensitisers, INV043 is a photo activatable compound.

"The compound is administered as an inactive form, and it localises to tumour tissues and any excess is cleared very quickly from healthy tissues," Dr Stephens explained.

"Once it is localised to the tumour, it can be activated using very specific wavelengths of red light that cause the compounds to transfer energy from the light and generate what we call singlet oxygen."

"Singlet oxygen is a very highly reactive molecule that damages biological structures that are at or very close to where it's been produced."

Dr Stephens said when INV043 is used this way, it generates what is like a "small explosion" inside the cell, which causes damage and ultimately leads to the cell dying.

## Low toxicity

As well effectiveness against cancer cells, Dr Stephens said INV043 has been evaluated for toxicity, both when the compound is inactive and after it has been activated.

"We have used doses up to 2,500 times the therapeutic dose and we can find no toxicity whatsoever," Dr Stephens explained.

 ding more formal studies, of course, that bodes very well and suggest that its unlikely there will be any toxic effects."

 v with chemotherapy, for example, people get quite sick when they're treated and that's due to use of off target effects – the chemotherapy acts in other places than the cancer."

 Dr Stephens pointed to the fact that INV043 was different in that it is very specific with the cells it targets.

 is localised very, very specifically to the cancerous tissue and so off target effects are really unlikely."

# Proof-of-concept studies

Invion has recently completed proof-of-concept studies using INV043 in treating different kinds of cancerous tissues.

In May this year, the company revealed the results from the studies, which showed INV043 had 50-times more phototoxicity than the company's former IVX-P03 drug.

It also found INV043's phototoxicity was 600-times greater than the currently used photosensitiser Talaporfin sodium.

Dr Stephens said the proof-of-concept work was designed to specifically look at INV043's ability to damage tumour tissue.

He looked at three different cancers: t-cell lymphomas, pancreatic and triple negative breast malignancies.

Dr Stephens said these cancers are typically quite difficult to treat.

"The results were quite striking. INV043 was very effective at treating all of those types of cancers."

He did not see any regrowth of the treated cancer tissue over the study period.

"It really was a very effective proof-of-concept study."

"Our proof-of-concept studies have really shown us a number of quite significant findings for INV043."

## Highly targeted treatment

To-date INV043 has been found to be non-toxic, highly active, and specifically targets cancerous tissue.

This is while being cleared rapidly from healthy cells, which results in low side effects.

"Probably one of the most important features at this point I think is the specificity for the tumour," Dr Stephens said.

This compares to current standard chemotherapies, which have a lot of side effects.

"Because INV043 is very selectively taken into the tumour tissue, and that's where it acts, those side effects are mitigated," he explained.

## Photosensitising advantages

An advantage to a photosensitising agent is that many are also fluorescent when exposed to blue light.

"INV043 is special because it has a very high what we call quantum yield, which means it is very efficient at absorbing, then emitting light photons," Dr Stephens said.

The ability of INV043 to become fluorescent is so good and the fluorescence is so bright that in fact when you use a very low intensity blue light it fluoresces bright red, and you can see very small tumour deposits quite clearly by eye."

Dr Stephens noted INV043's high fluorescence also gave it a potential use in the diagnostic space.

It can be used for looking at very small tumour deposits that otherwise can't be seen, or to define the margins of a tumour, assist in surgeries, or to treat and ablate any remaining tumour tissue that's present," he added.

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Lorna has more than 15 years' experience as a business/finance journalist and editor. She has written for numerous industry publications reporting on various sectors, including: resources, energy, construction, biotech, pharma, science and technology, agriculture, and chemicals. Specialising in resources, Lorna has also covered a myriad of small and large cap ASX and dual-listed stocks.

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