

## PHOTOSOFT™ EFFICIENTLY DESTROYS OVARIAN CANCER CELLS IN VITRO

- **Invion and Hudson Institute of Medical Research are collaborating on R&D projects for the Photosoft™ technology as a treatment of a range of cancers**
- **Photosoft™ characterisation studies have been completed in multiple ovarian cancer cell lines**
- **Photosoft™ caused efficient and highly effective cancer cell destruction *in vitro***

**Melbourne, Australia, 5 July 2018:** Invion Limited (ASX: IVX, “Invion” or “Company”) is pleased to announce that initial characterisation of the novel chlorophyll based photodynamic therapy, Photosoft™ in ovarian cancer has been completed under its Research & Development Alliance Agreement with leading Australian medical research institute, Hudson Institute of Medical Research (“Hudson Institute”).

Spectral characteristics, cellular uptake and clearance, intracellular localisation, dark and photo-toxicity were investigated in multiple ovarian cancer cell lines (human and murine) in both 2D and 3D organoid culture *in vitro*.

Photosoft™ caused efficient and highly effective cancer cell destruction *in vitro*, with 100% cell death achieved in a matter of minutes following light activation.

In the absence of light activation, Photosoft™ was completely non-toxic to cells – highlighting its potential for clinical application without inducing non-specific phototoxicity, a major impediment experienced in the clinical application of other photosensitiser compounds.

Photodynamic Therapy (PDT), combining a photo-sensitising compound and light to generate destructive reactive oxygen species, is an effective strategy for tumour tissue ablation. The efficiency of a photosensitiser is one of the main factors for determining its feasibility as a Photodynamic Therapy. Whilst several photosensitisers are clinically approved, some have undesirable properties including extreme photosensitivity, poor water solubility and inadequate selectivity, limiting their clinical application.

Dr Andrew Stephens, Group Head of the Ovarian Cancer Biomarkers Research Group at Hudson Institute said, “The Photosoft characterisation studies demonstrate that Photosoft™ efficiently produces reactive oxygen species to destroy tumour cells *in vitro*, and that modulation of light energy can be used to control the mechanism of induced cell death.”

Managing Director and Chief Executive Officer, Dr Greg Collier, said “Ovarian cancers have a greater than 70% 5-year mortality rate, and patients almost universally develop recurrent, chemo-resistant disease.

“New therapies are urgently needed and we are very pleased with this early progress under our R&D Alliance Agreement with Hudson Institute. This data lays the groundwork for ongoing preclinical trials of the Photosoft™ technology as an indication for chemo-resistant, solid ovarian tumours.”

Further results of these studies will be presented in September 2018 at a major international conference.

## About the studies

The spectral characteristics and production of reactive oxygen species (ROS) by Photosoft™ were examined using *in vitro* assays. Cellular uptake and clearance were monitored using fluorescence in multiple ovarian cancer cell lines (2D and 3D), with sub-cellular localization determined using specific organelle staining (Endoplasmic Reticulum (ER), Golgi, lysosomes, mitochondria). Cell death and IC90 were determined following exposure to red light. The mechanism of induced cell death was determined using antibody arrays.

Photosoft™ efficiently produced ROS following illumination *in vitro*, and uptake into ovarian cancer cells was time and concentration dependent. In the absence of activation, Photosoft™ remained non-toxic even at high concentrations; once activated Photosoft caused rapid cancer cell death dependent on time, concentration and light energy.

Moreover, Photosoft™ effectively penetrated and induced cell death in 3D spheroids, suggesting its suitability for ablation of established, solid tumours.

## About Photodynamic Therapy (PDT)

Invion is developing Photosoft™ technology as an improved next generation Photodynamic Therapy. PDT uses non-toxic photosensitisers and visible light in combination with oxygen to produce cytotoxic-reactive oxygen that kills malignant cells, shuts down tumours and stimulates the immune system. In contrast to surgery, or radiotherapy and chemotherapy which are mostly immunosuppressive, PDT causes acute inflammation, expression of heat-shock proteins, and invasion and infiltration of a tumour by leukocytes.

## About Invion

Invion is a clinical-stage life-sciences company that holds the Australia and New Zealand license to the Photosoft™ technology for the treatment of all cancers. Research and clinical trials are funded by the technology licensor, The Cho Group, which will provide non-dilutive funding to the Company. Invion is listed on ASX (ASX:IVX).

## About Hudson Institute of Medical Research

Hudson Institute of Medical Research is a top Australian biomedical research institute, recognised internationally for delivering better health through research into cancer, inflammation and reproduction and development. The Institute is home to 470 world-class scientists and students who work together to solve complex problems in human disease. Hudson Institute is a foundation member of the Monash Health Translation Precinct (MHTP), a major medical and scientific research hub based at the Monash Medical Centre in Melbourne's south-eastern corridor. With its precinct partners, Monash Health and Monash University, Hudson Institute creates a culture of collaboration and innovation that delivers research advances to benefit human health. The Precinct's unique, end-to-end translational environment is supported by state-of-the-art laboratories, world leading technology platforms and a clinical trials centre in its \$87.5 million MHTP Translational Research Facility.

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## Investor enquiries

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