



## UWA technology licensing/ partnering opportunity:

### Triple negative breast cancer therapy

Researchers at the University of Western Australia and Harry Perkins Institute of Medical Research have developed a compound that selectively decreases chemoresistance in triple negative tumours providing a new therapeutic opportunity for these cancer patients.



**Problem:** Triple negative breast cancers (TNBCs) are aggressive malignancies found in ~15% of all cases of breast cancer. Due to the lack of estrogen receptor, progesterone receptor, and human epidermal growth factor receptor-2 (HER-2) expression, TNBCs fail to respond to endocrine and anti-HER2 therapies. Currently, there are no approved targeted therapies against TNBCs and the treatment choice is very limited and ineffective.

Transcription factor Engrailed 1 (EN1) overexpression in TNBC's is associated with enhanced cell proliferation, metastasis, and increased drug resistance. Transcription factors, unlike other molecular cancer targets such as tyrosine kinase receptors have largely remained "undruggable" due to their small molecular binding pockets.

**Solution:** We have developed a proprietary, optimized interference peptide against EN1 (EN1-iPep) that overcomes this problem. These peptides selectively decrease chemoresistance in basal-like triple negative tumors. Preclinical treatment with EN1-iPep results in a highly synergistic pharmacological interaction with docetaxel (DTX) in inhibiting cancer cell growth.

**Stage of development: Preclinical:-** We have shown the proof of principle *in vitro* with multiple cell lines, demonstrating the efficacy of the peptide to induce caspase-3 apoptosis in triple negative breast cancer cell lines with no effect in primary mammary epithelial cells (human) or cell lines that do not express the oncogene EN-1.

Following simultaneous administration of anti-cancer drug DTX and EN1-iPep, EN1-iPep improves the potency of DTX compared to current commercial gold standard Abraxane® in reducing viability of stem cell-enriched T11 cells, and inhibits tumor growth and enhances survival *in vivo* in BALB/c mice implanted with T11 allografts.

We demonstrated that EN1-iPep is highly selective in inducing apoptotic cell death in basal-like cancer cells with negligible effects in a non-neoplastic human mammary cell line.

Engrailed members have been found overexpressed in many other (highly aggressive) metastatic malignancies, other than breast cancer, such as bladder cancer and non-resectable prostate cancer and some brain tumors (glioblastomas).

#### **Intellectual Property:**

U.S. 14/518,632. entitled "Interference Peptides and Use Thereof" is currently under examination.

#### **The Team:**

The team of investigators comprises leaders in the field of research with extensive experience in the field of cancer, industry, consulting and patenting.

Associate Professor Pilar Blancafort completed her post-doc at the Scripps Research Institute and is a group leader at the Harry Perkins Institute for Medical Research. Prof. Blancafort is an ARC Future fellow and a Cancer Council of Western Australia Research fellow. Her work is characterized by highly innovative approaches to target cancer drivers, as is reflected by her innovative awards, such as two Department of Defense breast cancer Idea awards, four NIH/NCI awards, and more lately a novel concept award from the National Breast Cancer Foundation (NBCF).

**UWA is seeking a commercial partner to in-licence and develop this technology as an anti-cancer therapy.**

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