



## TECHNOLOGY

# Inhibition of Breast Cancer Metastases using Natural Extracts from *Colocasia Esculenta* (Taro).

## OVERVIEW

Studies link breast cancer, the second leading cause of cancer-related mortality in US women, with the occurrence of metastatic disease and spread. However, the majority of current therapies focus on the treatment of solid tumors with very little focus on targeting the metastatic process. Due to the significant correlation of secondary tumors to that of patient mortality, there is a need to identify new therapies with particular relevance to the spread of breast cancer cells from primary tumor site. One potential treatment comes from the extract of the *Colocasia esculenta* (commonly known as taro), which has demonstrated a potent, anti-metastatic effect against tumor metastasis in tumor mouse models. In preliminary studies, tumor cell lines treated with taro extract (TE) displayed a complete inhibition of cellular migration. TE modestly inhibited the proliferation of some, but not all, breast and prostate cancer cell lines, and morphological changes such as cell rounding were observed. However, mice treated with TE displayed reductions in lungs tumor colony formations and reduced spontaneous metastases from mammary gland-implanted tumors. Further investigations in *in vitro* studies revealed inhibition of prostaglandin E2 (PGE2) synthesis and down regulation of cyclooxygenase 1 and 2 mRNA. Analysis of the active component of TE revealed similarities to three related proteins: 12kDa storage protein, tarin, and taro lectin. The active components of TE are being further tested as a potential new therapeutic against metastatic breast cancer and other types of aggressive cancers.

## APPLICATIONS

Cancer patient mortality is most often caused by metastatic spread through the bloodstream, rather than by the primary tumor. The Bone & Cancer Foundation report that approximately 20% of women diagnosed with early breast cancer will have their cancer return within 10 years of diagnosis. Among these women, 70% have cancer spread to the bone as well as other organs such as the lungs, liver, or brain. The oncology market continues to grow with the majority of sales growth attributed to an increase in targeted cancer therapies. In 2009, US sales of targeted anticancer therapies reached \$10.4 billion with monoclonal antibodies and small-molecule drugs in the lead. A different market perspective for targeted cancer therapies is the burgeoning natural products industry. Current trends show that 50 to 70% of breast cancer patients use some form of complementary therapy, including dietary supplements and herbal remedies. Clinical trials are underway for select complementary therapies which may be effective in cancer prevention or therapy, for example: green tea for breast and prostate cancer and beta-glucan for lymphoma.

## ADVANTAGES

-This water-soluble extract is expected to have minimal toxicity due to its derivation from a common food product. - Potent and specific inhibition of metastases in mouse models -Positive results for oral formulations

## STAGE OF DEVELOPMENT

Preliminary studies show: Anti-metastatic activity demonstrated in mouse models Active component of TE isolated, with further characterization studies ongoing

## R&D REQUIRED

Further investigations required on the purified component of TE as drug candidate .

## LICENSING POTENTIAL

UM seeks to develop and commercialize by an exclusive or non-exclusive license agreement and/or sponsored research with a company active in the area.

## CONTACT INFO

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## Additional Information

### INSTITUTION

University of Maryland, Baltimore

### PATENT STATUS

US Patent 8,865,642 issued 10/21/2014

### CATEGORIES

- Therapeutics
- Biologics
- Natural Compounds

### INVESTIGATOR(S)

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### EXTERNAL RESOURCES

- [Antimetastatic activity isolated from Colocasia esculenta \(taro\).](#)
- [Differential polarization of immune responses by co-administration of antigens with chemokines.](#)

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