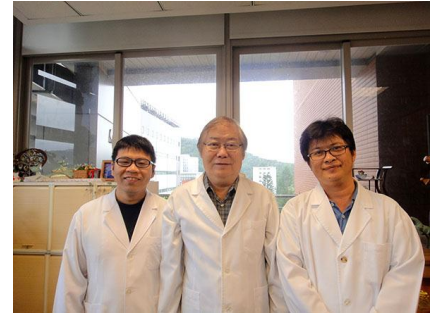


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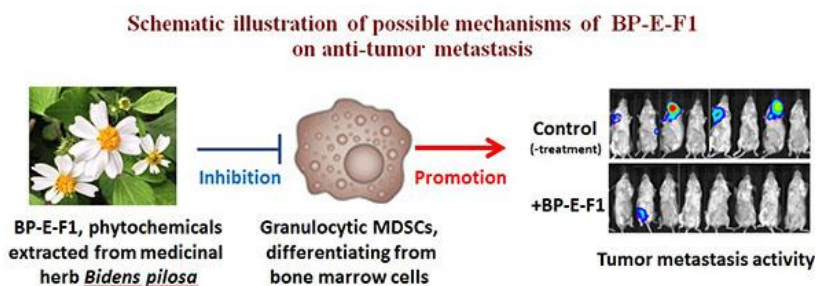
Extract of medicinal plant *Bidens pilosa* may fight breast cancer metastasis and recurrence

The pretty flowers of *Bidens pilosa*, sometimes known as Spanish needle or cobbler's pegs can be seen growing in the wild all over Taiwan, and the plant is a popular folk medicine. Now *Bidens pilosa* has been found to have potential for use as a treatment for breast cancer. A research team lead by Dr. Ning-Sun Yang, Distinguished Research Fellow at the Agricultural Biotechnology Research Center (ABRC) recently demonstrated that a phytochemical fraction of extract from *Bidens pilosa* effectively suppressed mammary tumor metastasis and prolonged survival of test mice, via inhibiting the differentiation and function of certain immune cells in a tumor-resection model. This research was published in *Scientific Reports* on November 18, 2016.



The research team: Mr. Lin Sheng-Yen, Ph. D. student at the Graduate Institute of Life Sciences of National Defense Medical Center; Dr. Ning-Sun Yang, Distinguished Research Fellow, ABRC; Dr. Wen-Chi Wei, postdoctoral fellow, ABRC

The global incidence of cancer continues to rise. Breast cancer is not only the most common cancer in women but also the second most common cancer worldwide. The majority of cancer deaths are known to be caused by metastases, not by primary tumors. Therefore, understanding the mechanism of cancer metastasis and effective inhibition of cancer metastasis are an important clinical issue for cancer treatment.



The research team's findings strongly suggest that specific plant polyacetylenic glycosides that can target gMDSC differentiation by communicating with bone marrow cells, may have potential application as a botanical drug against specific metastatic cancers.

Dr. Yang's laboratory showed that oral feeding with a photochemical fraction of *Bidens pilosa* named BP-E-F1 effectively suppressed tumor metastasis, apparently through the inhibition of tumor-induced accumulation of gMDSCs, an important type of immune cell. This treatment effect did not result in body weight loss in test mice, unlike the cohort of mice treated with the commonly-used chemotherapy agent, docetaxel. BP-E-F1 has further been demonstrated to exert its anti-metastasis activity through inhibiting the differentiation and function of gMDSCs. Pharmacokinetic and mechanistic studies further revealed that BP-E-F1 suppressed the differentiation of gMDSCs

via the inhibition of a tumor-derived, G-CSF-induced signaling pathway in bone marrow cells of test mice. The finding was further supported by the presence of orally-delivered phytochemicals in bone marrow *in vivo*.

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Taiwan and PCT patents for these biotechnology findings have been applied for and the associated knowhow is expected to be transferred to biotechnology companies for future possible botanical drug development.

The research was supported by grants from Academia Sinica, the Ministry of Science and Technology and the Department of Chinese Medicine and Pharmacy of the Ministry of Health and Welfare.

The co-first authors of this study are Dr. Wen-Chi Wei (postdoctoral fellow at ABRC) and Mr. Lin Sheng-Yen (a Ph.D. student at the Graduate Institute of Life Sciences of National Defense Medical Center).

The full research article entitled "Inhibiting MDSC differentiation from bone marrow with phytochemical polyacetylenes drastically impairs tumor metastasis" is available at the Scientific Reports website at: <http://www.nature.com/articles/srep36663>